

Final

Environmental Assessment

Aerial Application of Pesticide for Mosquito Control at Tyndall Air Force Base and Vicinity



**Department of the Air Force
Air Education and Training Command
325th Fighter Wing
Tyndall Air Force Base, Florida**

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**FINDING OF NO SIGNIFICANT IMPACT
FOR
AERIAL APPLICATION OF PESTICIDE FOR MOSQUITO CONTROL
AT
TYNDALL AIR FORCE BASE AND VICINITY**

AGENCY: Department of the Air Force, Air Education and Training Command,
325th Fighter Wing, Tyndall Air Force Base (AFB), Florida.

DESCRIPTION OF ACTION:

The intent of the proposed action is to conduct aerial mosquito control by applying the chemical pesticide, Naled to control adult mosquitoes, over approximately 17,000 acres of Tyndall Air Force Base (AFB) and approximately 145,000 acres of surrounding jurisdictions of Bay and Gulf Counties. The number, type, and timing of treatments will be based upon mosquito surveillance data, health information, and local environmental conditions as monitored by environmental, health, and mosquito control professionals from Bay and Gulf Counties and Tyndall AFB. The objectives of this action are to reduce the potential threat of human disease caused by mosquito vectors through intervention in the transmission cycle and to reduce mosquito-induced discomfort, annoyance, and distraction experienced by personnel at Tyndall AFB and surrounding civilian communities.

Six alternatives were considered based upon industry-accepted methodologies and best pest management practices. Two were eliminated from detailed study because they either did not meet project objectives or were not feasible for other reasons. These two alternatives were:

- 1) Conduct ground-based chemical insecticide treatment over entire proposed treatment area;
- 2) Mechanically manipulate marshland/wetland breeding areas through drainage or open marsh management activities.

The following four alternatives were considered in detail:

- 1) No Action;
- 2) Enhance biological and biorational control measures and encourage the use of personnel protective measures;
- 3) Conduct aerial larval control using *Bacillus thuringiensis* var. *israelensis* (B.t.i.), limited to Tyndall AFB property and not to exceed 3 applications per season;
- and 4) Conduct aerial adult mosquito control using Naled on Tyndall AFB property and adjacent areas of Bay and Gulf Counties. Applications would not exceed three treatments per season, except under medical emergency conditions.

It is concluded that alternatives 1 and 2 would not result in an acceptable degree of intervention in a potential mosquito-borne disease cycle and would not cause a noticeable decline in biting mosquito populations and subsequent biting annoyance levels. Alternatives 3, and 4, offer successive degrees of interruption of a potential mosquito-borne disease cycle and reduction of annoyance levels, due to increased options for choice of treatment materials and a broader treatment area. Alternative 4 covers the widest coordinated treatment area and, therefore, benefits the greatest number of affected residents.

SUMMARY OF FINDINGS:

If aerial mosquito pesticide application is the selected alternative, biting mosquitos, especially the species *Aedes sollicitans* and *Aedes taeniorhynchus*, will be noticeably reduced. The potential for mosquito-borne disease threat to humans will be reduced and relief from biting

mosquitoes will be experienced by the human population. Non target foraging honey bees and bees originating from unprotected hives may be killed by adulticide treatment. Coordination with local beekeepers will reduce the impact on managed bees.

Non-target arthropods, including flying insects, will likely be killed if they come in direct contact with the adulticide spray material. This could include flies, bees, wasps, moths, dragonflies, damselflies, and butterflies. Non-target copopods and some related aquatic organisms may show a temporary decline in numbers upon contact with the adult control material. With the planned limited and judicious use of the control agents, these species should show rapid recovery. The aerially-applied control agents will temporarily affect the local air quality. Both materials settle to the ground, water, or vegetative substrate within hours after application, where they begin to biodegrade and hydrolyze.

FINDING OF NO SIGNIFICANT IMPACT:

Following review of the site-specific Environmental Assessment (EA), which was based upon the best currently available information, we have determined that implementing this decision in the manner described will not cause significant environmental impacts or adverse effects. Therefore, an Environmental Impact Statement is not required. The Finding of No Significant Impact (FONSI) was made considering significant effects in terms of context and intensity. The proposed aerial pesticide application will cover approximately 17,000 acres of Tyndall AFB grounds and 145,000 acres of Bay and Gulf Counties and a site-specific EA evaluates the environmental consequences in that particular context. The intensity of effects is minimal for the following reasons:

- a. This action involves the use of a chemical adulticide which are registered for the control of mosquitoes and which would be applied according to label instructions. This meets the provisions of Public Law 92-516, the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) of 1947, as amended.
- b. Adverse effects associated with this project are not significant.
- c. This action will not negatively effect any known rare, threatened, or endangered species residing near the proposed treatment area.
- d. The pesticides used will not negatively affect parklands, farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
- e. No highly uncertain, unique, or unknown risks to the human environment are associated with the proposed action.
- f. The decision to proceed is based upon the results of a site-specific environmental analysis conducted in accordance with the National Environmental Policy Act (NEPA).
- g. The action will not affect any item listed or eligible for listing on the National Register of Historic Places nor will it cause destruction of any significant scientific cultural or historical resource.

h. The proposed action complies and is in conformance with all Federal, State, and local laws or requirements imposed for protection of the environment. The action is a cooperative effort planned by the U.S. Air Force, and the surrounding communities.

SUMMARY OF PUBLIC REVIEW AND INTERAGENCY COORDINATION:

With the intent to solicit public comments in regard to the draft EA, 30-day public review period was held between the dates of 15 June 2008 and 14 July 2008. The public review period was announced in a public notice published in the Panama City News Herald. Copies of the draft EA were made available for public review at the Bay County Public Library and the Tyndall AFB Public Affairs Office. No public comments were received during the public review period.



JOHN D. BIRD II, Colonel, USAF
Vice Commander, 325th Fighter Wing
Tyndall AFB, Florida

21 OCT 08

Date

COVER SHEET
ENVIRONMENTAL ASSESSMENT
Aerial Application of Pesticide for Mosquito Control at
Tyndall Air Force Base and Vicinity

- a. **Responsible Agency:** U.S. Air Force
- b. **Proposed Action:** Aerial spraying of pesticide to control adult mosquitoes and dog flies at Tyndall Air Force Base (AFB), Florida and adjacent areas of the cities of Bay and Gulf Counties.
- c. **Written comments and inquiries** regarding this document should be directed to: Mr. Jose J. Cintron, 325 CES/CEV, 119 Alabama Ave., Tyndall AFB, FL, 32403; telephone: (850) 283-4341
- d. **Report Designation:** Environmental Assessment (EA)
- e. **Abstract:** This EA addresses the aerial control of mosquitoes at Tyndall AFB, Florida and the nearby cities of Bay and Gulf Counties. The EA is prepared in compliance with the National Environmental Policy Act of 1969, as amended, and in accordance with: Title 40, CFR Part 1500-1508, Council on Environmental Quality; DoD Instruction 4150.7, DoD Pest Management Program; and AFI 32-1074, Aerial Application of Pesticides.

Surveillance results indicate that mosquito species present at Tyndall AFB and the immediate civilian neighborhoods are capable of transmitting serious human diseases. Mosquito populations are large enough, at certain times, to cause human pain, discomfort, and stress. In extreme cases they may seriously affect the performance of outdoor work activities, reduce recreational opportunities, and decrease the overall morale and quality of life within the infested area.

Two alternatives are eliminated from detailed studies because they do not meet project objectives, are not feasible, or involve a geographic area where jurisdictional government coordination and agreements had not been established. The four alternatives considered are:

- A. No action
- B. Enhance only biological and biorational control measures and encourage the use of personnel protective measures.
- C. Conduct aerial larval control using *Bacillus thuringiensis* var. *israelensis* (*B.t.i.*), limited to Tyndall AFB property and not to exceed 3 applications per season.
- D. Conduct aerial adult mosquito control using Naled for such use on Tyndall AFB property and adjacent areas of the cities of Bay and Gulf Counties in order to create a buffer to mosquito activity. Applications would not exceed three treatments per season, except under medical emergency conditions.

The environmental consequences of each alternative are discussed in relation to identified major issues and concerns associated with the aerial application of pesticides. Environmental, health, and safety risks associated with the proposed alternatives are discussed. Mitigating measures that address specific concerns are offered.

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**Final Environmental Assessment
Aerial Application of Pesticide for
Mosquito Control at
Tyndall Air Force Base and Vicinity**

1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 PURPOSE OF THE PROPOSED ACTION

The United States Air Force (USAF) proposes to conduct aerial spraying of pesticide to control adult mosquitoes and dog flies at Tyndall AFB, Florida and adjacent areas of Bay and Gulf Counties. When maximum ground control is inadequate to control excessive mosquito population, aerial spraying is required to reduce the threat of a mosquito-borne disease outbreak. The transitory and unpredictable natures of dog fly infestations, which occur along the shorelines, often require rapid treatment to achieve control. Excessive populations of mosquitoes and dog flies restrict outdoor work and recreation, and thus, adversely affect the efficiency and morale of personnel.

1.2 NEED FOR THE PROPOSED ACTION

The geomorphic, physiographic, and climatic features of this area contribute to the formation of considerable expanses of wetlands, brackish, and salt marshes which, in turn, provide extensive mosquito-breeding habitat. This, in conjunction with present day human land use and, more specifically, activities relating to the Air Force's mission at Tyndall AFB, creates a situation where the human and mosquito populations frequently interface.

Efficient mosquito vectors of encephalitides, including West Nile virus (WNV), are present on or around Tyndall AFB and vicinity. West Nile virus first appeared in Bay County in 2003 when 14 human cases were reported; one case occurred, approximately one mile north of the Silver Flag Training Area. Since then, sentinel birds have been exposed to WNV from mosquitoes every year making this virus endemic to the area. Walton County has been under a medical advisory for WNV as recently as 2005. Eastern Equine Encephalitis is also endemic to the region. Malaria and dengue have been documented sporadically from travelers and military personnel who have contracted malaria while overseas. Dog heartworm, *Dirofilaria immitis*, a mosquito-borne filarial parasite of canines that on occasion has been found in man, is prevalent throughout coastal Florida.

Large mosquito populations can cause human pain, discomfort, and stress. Aircraft maintenance personnel, security forces, fire department employees, and others who work outdoors may be adversely affected when the mosquito population is high. While each individual's predisposition to mosquito bites varies, morale and productivity are generally adversely impacted during periods of high mosquito activity. Adverse psychological reactions can be a factor in some individuals. Intense mosquito activity causes a decline in base personnel utilizing outdoor recreation facilities such as the golf course, athletic fields, playgrounds, and picnic areas. The overall effect of this decline

can result in reduced productivity and negative morale for assigned personnel, their dependents and residents of the civilian communities.

Mosquito populations can be reduced by the application of microbial and chemical insecticides. The aerial dispersal of these materials, when done with care, has proven to be an effective means to reduce mosquito populations of certain species, over a broad area.

1.3 LOCATION OF THE PROPOSED ACTION

Tyndall AFB is located approximately 13 miles east of Panama City in the southeastern corner of Bay County, Florida (Figure 1-1). The Base is approximately 18 miles long by 3 miles wide, and encompasses nearly 30,000 acres on a peninsula that is surrounded by the waters of the Gulf of Mexico to the south, St. Andrews Bay to the west, and East Bay to the north. U.S. Highway 98 runs through the peninsula, dividing the Base into north and south segments. Bay and Gulf Counties cover approximately 843,000 acres and are comprised of wetlands, woods, and civilian residential communities.

Bay and Gulf Counties Mosquito Control Council will determine where mosquito hot spots are located in the counties to ensure only problem areas are treated. Under most circumstances, only hot spots within this spray area will be treated unless a significant mosquito-borne disease threat is present. All environmentally sensitive areas will be identified on the spray map and only sprayed if proper approval is obtained. Apiaries and known sensitive individuals will be identified and public notifications will be carried out prior to any aerial spraying.

1.4 SCOPE

This Environmental Assessment (EA) was prepared in accordance with Air Force Instruction (AFI) 32-7061, *Environmental Impact Analysis Process*; 32 CFR 989, *Environmental Impact Analysis Process*; and the President's Council on Environmental Quality (CEQ) *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (40 CFR Parts 1500-1508). This EA identifies the possible environmental impacts the proposed action would have and the magnitude of those impacts. If the environmental impacts are found to be significant according to CEQ's criteria (40 CFR Part 1508.27), an Environmental Impact Statement (EIS) would be prepared before Tyndall AFB implements the proposed action. If such impacts are found to be relatively minor, a *Finding of No Significant Impact* (FONSI) would be issued and Tyndall AFB may proceed with the proposed action.

1.5 ISSUES NEEDING NO FURTHER CONSIDERATION

None of the alternatives would have an impact on transportation, cultural resources, floodplains, explosive clear zones of the base, or socioeconomic.

After a careful analysis of the proposed actions, no minority or low-income group would be unduly affected by implementing or by not implementing the proposed action for any of the

alternatives. Thus, environmental justice is not an issue that will be pursued further in this EA.

Therefore, this EA will not consider transportation, cultural resources, floodplains, explosive clear zones, socioeconomics, and environmental justice further.

1.6 APPLICABLE REGULATORY REQUIREMENTS

Regulations relevant to the resources assessed in this EA include, but are not limited to, the following:

- Title 40, Parts 1500-1508
- Title 32 CFR Part 989, *Environmental Impact Analysis Process*
- Noise Control Act
- Clean Air Act (CAA)
- Clean Water Act (CWA)
- Rivers and Harbors Act
- National Historic Preservation Act (NHPA)
- Archaeological Resources Protection Act (ARPA)
- Endangered Species Act (ESA)
- Coastal Zone Management Act (CZMA)
- Resource Conservation and Recovery Act (RCRA)
- Executive Order (EO) 11988, Floodplain Management
- EO 11990, *Protection of Wetlands*
- EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*
- EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*
- EO 13175, *Consultation and Coordination With Indian Tribal Governments*

1.7 CONSULTATION REQUIREMENTS

1.7.1 Coastal Zone Management Consistency

The federal CZMA provides assistance to states, in cooperation with federal and local agencies, for developing land and water use programs in coastal zones. According to Section 307 of the CZMA, federal projects that affect land uses, water uses, or coastal resources in a state's coastal zone must be consistent, to the maximum extent practicable, with the enforceable policies of that state's federally approved coastal zone management plan. The Florida Coastal Management Program (FCMP) is based on a network of agencies implementing 23 statutes that protect and enhance Florida's natural, cultural, and economic coastal resources. The Florida Department of Environmental Protection (FDEP) implements the FCMP through the Florida State Clearinghouse. The Clearinghouse routes applications for federal activities, such as EAs, to the appropriate state, regional, and local reviewers to determine federal consistency with the FCMP. Applicants are required to submit their own preliminary consistency determination along with the EA to the Clearinghouse. Following their review of the EA, the FCMP

state agencies provide comments and recommendations to the Clearinghouse based on their statutory authorities. Based on an evaluation of the comments and recommendations, FDEP makes the state's final consistency determination, which will either agree or disagree with the applicant's own consistency determination. Comments and recommendations regarding federal consistency are then forwarded to the applicant in the state clearance letter issued by the Clearinghouse. Copies of the draft EA along with Tyndall AFB's own FCMP consistency determination, which is provided as Appendix A, will be sent to the Florida State Clearinghouse to obtain the state's FCMP consistency determination for the Proposed Action. The state's FCMP consistency determination for the Proposed Action will be included in Appendix B and discussed in the Final EA.

1.7.2 Regulatory Agency Consultation

To satisfy the NEPA requirements regarding regulatory agency consultation for the EA, a correspondence letter and copy of the draft EA were sent to the U.S. Fish & Wildlife Service (USFWS). Consultation with pertinent state agencies, including the Florida Fish & Wildlife Conservation Commission (FFWCC) and State Historic Preservation Officer (SHPO) occurred through the Florida State Clearinghouse. Comments from all regulatory agencies were included in Appendix B and discussed in the Final EA.

1.7.2.1 Endangered Species Act

Endangered Species Act requires that all federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitat. If a proposed action involves listed species or critical habitat, the federal agency must consult with the USFWS.

1.7.3 Public Involvement

A 30-day public review period was held 15 June 2008 – 14 July 2008 to solicit public comments on the draft EA. The public review period was announced in a public notice that was published in the *Panama City News Herald* of Panama City, Florida. Copies of the draft EA were made available for public review at the Bay County Public Library and the Tyndall AFB Public Affairs Office. Copies of the public notices and public review correspondence were included in Appendix C and public comments will be discussed in the Final EA. No public comments were received during the public review period.

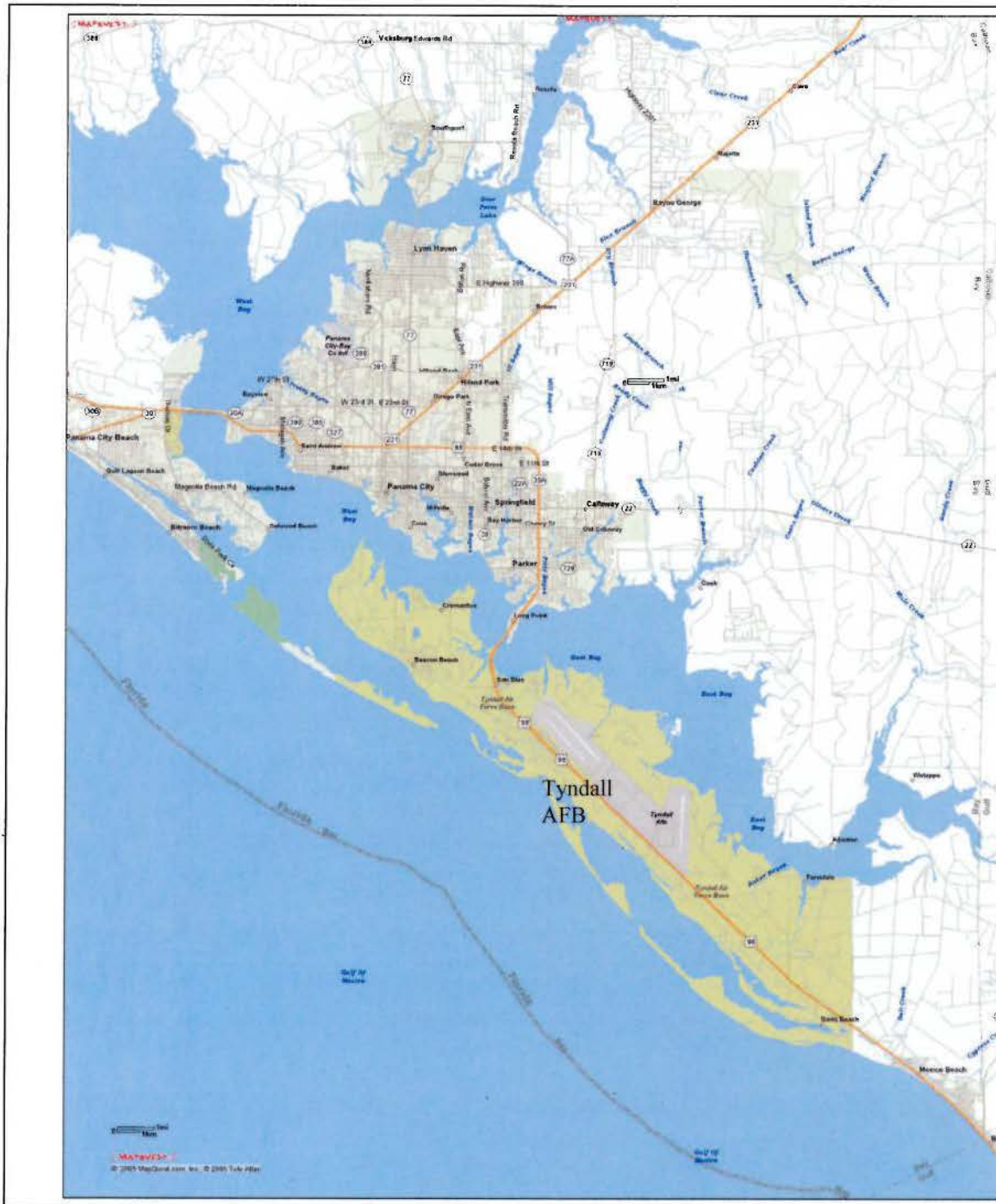


Figure 1.1
Vicinity Map

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 TREATMENT SITE AND ACREAGE

It is proposed to spray pesticides by aerial dispersal for adult mosquito control on approximately 17,000 acres of Tyndall AFB and approximately 145,000 acres of surrounding jurisdictions. The proposed treatment area would be limited to the base property and cities of Bay and Gulf Counties (Figures 2. 1, 2.2, and 2.3).

2.2 MOSQUITO TARGET SPECIES

The primary species to be controlled by this action are adult mosquitoes, adult dog flies, and adult biting midges. Primary mosquito species found in the area include: *Aedes taeniorhynchus*, *Aedes sollicitans*, *Culex salinarius*, and *Psorophora ferox*. Several of these species are known to transmit Eastern Equine Encephalitis (EEE) and West Nile virus (WNV). WNV has occurred on lands adjacent to the installation during the past five years. Adult dog flies (*Stomoxys calcitrans*) and biting midges (*Culicoides furens*, *C. mississippiensis*, and *C. melleus*) are nuisance pest that reach unacceptably high levels in some years, adversely impacting morale.

2.3 BIOLOGICAL EVALUATIONS AND DECISION MAKING CRITERIA

In order to determine the seasonal need and timing for the proposed treatment several organizations need to be consulted. Aerial spray determinations are based upon the regional human and animal reports of sicknesses or deaths attributable to mosquito-borne disease (e.g., reports of horse deaths due to WEE); the mosquito population potential as influenced by environmental and climatic conditions (e.g., tidal influence affecting salt marsh mosquito brood hatch), actual mosquito count (light trap counts, larval dipping, landing rates), and human complaints. Representatives from the following organizations have been and will be consulted to determine the need for spraying:

1. Youngstown Air Reserve Station (*Maj Mark Breidenbaugh or Capt Karl Haagsma*)
2. HQ AETC/A7CVI
3. Tyndall AFB, Environmental Flight
4. Tyndall AFB, Public Health
5. Tyndall AFB, Legal Office
6. Tyndall AFB, Entomology
7. Bay County Mosquito Control Council
8. Gulf County Mosquito Control Council

Communication between organizations would be through formal meetings and through informal telephone contact. Pertinent biological information would be exchanged weekly during the mosquito season. A consensus recommendation involving all organizations would be then passed on to the appropriate Air Force Officials in charge of the application. Aerial application would not take place unless **all** the evaluation criteria, including minimal mosquito surveillance thresholds (larval, adult light traps, adult landing rates) are fully met.

2.3.1 Factors Determining If And When To Treat

2.3.1.1 Disease Surveillance

The Environmental Flight and Entomology office would maintains regular contact with the Florida Health Department (FHD) through the Public Health office to monitor mosquito-borne diseases. Reporting of horse WEE and WNV cases would takes place through the Veterinary Community and FHD. Evidence of viral activity, as demonstrated by horse cases, is an important indication that a human threat may exist and that spraying is warranted. It should be noted from a surveillance standpoint, that widespread vaccinations of horses could mask this group as a disease risk indicator.

Arthropod-borne viral surveillance using caged sentinel fowl, wild birds (with appropriate permits), or viral assays of mosquitoes is not currently being done at Tyndall AFB, nor routinely in Florida. This is a programmatic shortcoming, for these methods can detect local viral activity prior to the advent of human cases. In lieu of this information, a consensus of all the representatives having disease surveillance/health responsibilities must agree that a potential mosquito-borne disease threat exists.

2.3.1.2 Mosquito Forecasts

A major basis for treatment timing is the predicted time of adult brood emergence of the mosquitoes, *Aedes vexans*, *Aedes dorsalis*, *Culiseta inornata* and *Culex tarsalis*. The *Aedes* species in the egg stage may remain viable for several years. *Aedes* mosquitoes are strong fliers and commonly fly up to 10 miles from their breeding places for a blood meal. The development time for *Culex tarsalis* is as short as one to two weeks from egg to adult when average temperatures are near 80°F in July. Peak mosquito activity usually occurs during the last week in June and continues throughout the month of July. The ideal larvicide treatment window is while the larvae are still feeding; generally end of May through June, in order to break the cycle of future mosquito activity.

2.3.1.3 Adult Mosquito Surveillance

Tyndall AFB would utilize four New Standard Traps, which would be operated twice per week. Bay and Gulf Counties also monitors a variable number of CDC traps augmented with compressed CO₂. Recommended treatment threshold values are presented in Table 2-1.

Landing rates would be determined by counting the number of biting mosquitoes that are attracted to a volunteer, during a set time and at a set location. The method typically used involves a single individual collecting (with an aspirator) any mosquitoes attracted to themselves within a one-minute time period. A count of 25 landing mosquitoes per minute observed in systematic transects, within good marsh-dwelling mosquito breeding habitat, is used as a minimum level that must be achieved for nuisance control, prior to the recommendation for aerial treatment (see Table 2-1). From a nuisance standpoint, Morris, et al. (1988) reports that, on the average, people feel there is a "bad" mosquito problem if they receive one attack about every minute.

2.3.1.5 Human Complaints

The Entomology section and the Public Health Office as well as Bay and Gulf Counties Mosquito Control Office would document complaints of biting mosquitoes. Although subjective in nature, complaints are used as indication of building mosquito populations (see Table 2-1).

2.4 TREATMENT METHOD

The treatment aircraft would be a C-130H Modular Aerial Spray System (MASS) specially outfitted for aerial spray application, provided and staffed by trained and certified personnel from the US Air Force Reserve (USAFR) - Youngstown Air Reserve Station, Vienna, Ohio. The local base of operations would be Tyndall AFB, FL. Overflights of spray aircraft would be at an elevation of 100 to 300 feet. The spray operations would concentrate on periods of high mosquito activity for adult control measures. A most common profile flown for adult mosquito control takes place two hours before sunset, if weather permits. This is generally when mosquito activity (biting/feeding) is greatest and weather conditions (wind and humidity) are most favorable for insecticide applications. Additionally, some applications may be conducted after dark.

2.5 TREATMENT MATERIALS

Trumpet^{TM1} (NSN 6840-01-532-5414, Environmental Protection Agency (EPA) Reg. No. 59639-90-5481), a formulation of 78% Naled (1,2-dibromo-2,2-dichloroethyl dimethyl phosphate) with 22% inert ingredients is recommended in aerial application for adult mosquito control. The recommended aerial ultra-low-volume (ULV) application rate is 0.6 to 1.2 fluid ounce of undiluted TrumpetTM per acre. Trumpet EC is a special formulation intended for use only in its undiluted form and can be flushed with water.

See Appendices A for product labels and Material Safety Data Sheets.

^{TM1} Trumpet is a registered trademark of AMVAC Chemical Corporation, Los Angeles, CA

Table 2-1
DECISION MATRIX FOR AERIAL MOSQUITO CONTROL
TYNDALL AFB AREAS,¹

Survey Methods and

Treatment Goals: Minimum Threshold Levels Required for Action

For Aerial Adult Control
Peak Rates Within 6 Days of Proposed Treatment

Adult Landing Rates²	<u>In Marshlands</u>	<u>On main Installation</u>
<u>Immediate goal:</u>		
Disease Vector Control ³	5/minute	1/minute
Nuisance Control ⁴	25/minute	5/minute
<u>Long-term goal:</u>		
Egg Base Reduction (Subsequent generations)	5/minute	1/minute

For Aerial Adult Control
Peak Rates Within 5 Days of Proposed Treatment

Light Trap Counts⁵	<u>Range/Marsh Site</u>	<u>Main Installation</u>
New Standard Light Traps Sites	<u>Trap Index[*]</u>	<u>Trap Index</u>
<u>Immediate goal:</u>		
Disease Vector Control	20 females	15 females
Nuisance Control	75 females	35 females
<u>Long-term goal:</u>		
Egg Base Reduction (Subsequent generations)	25 females	5 females

^{*}Number of collected females/(# traps x # nights)

DECISION MATRIX FOR AERIAL MOSQUITO CONTROL
TYNDALL AFB AND VICINITY

Complaints These are obtained from key base personnel. They include: Airfield Control, Security Forces, Family Housing Representatives, Commanders, Senior Leaders, Golf Course Employees, Personnel using sports fields, and Public Health Personnel. Key personnel shall be solicited to comment on mosquito activity 1 to 3 days prior to aerial spray. Criteria shall be that these personnel consider

mosquito populations to be moderate to heavy which, in turn, adversely affects their ability to conduct outdoor activities

Footnotes and Comment:

¹ This matrix applies to Tyndall AFB surveillance and pest management activities.

² On the proposed day of adult spraying, adult emergence should have peaked. Counts should be high or on the decrease as female mosquitoes leave the marshlands seeking blood meals. Landing rates are not used to validate the need for larval control. When fresh-water breeding adult mosquito activity is greatest, only measurements on main installation are useful.

³ When mosquito populations are judged to be a disease vector problem, their numbers may be below nuisance levels.

⁴ On the day of treatment, marsh-dwelling mosquitoes may not yet be a humanly perceived problem if they have not yet migrated away from the marshes.

⁵ On the day of aerial spraying, peak numbers may not be reached because marsh mosquitoes have just emerged and have not yet migrated to light trap locations. Prior to spraying there should be some indication that mosquito populations are building. For fresh-water breeding mosquitoes, the light trap is the primary surveillance method used to initiate and terminate adult mosquito control efforts, both aerial and ground based. It should be noted that trap catches are affected by environmental influences such as temperature, wind, rain, and moon phase.

Comment: All sampling methods provide a relative index of a biological population that is subject to wide swings in variation. All numbers listed above should be evaluated with a plus or minus 20 percent variation. Most importantly sampling data should indicate trends, specifically increasing populations and peak activity. The consensus of the representatives from Environmental, Public Health and Entomology offices would be the primary basis for classifying mosquitoes as a disease vector problem and using lower threshold limits.

2.6 PROCESS USED TO FORMULATE ALTERNATIVES

Best pest management practices and industry-accepted methodologies were considered in the formulation of alternatives. The presence of appropriate mosquito breeding habitat and consideration of reasonable adult mosquito flight ranges were used as criteria to delineate the proposed treatment boundaries. Limits on the frequency of treatments, which are stipulated in some alternatives, are based upon historical and biological need.

2.7 ALTERNATIVES ELIMINATED FROM DETAILED STUDIES

Two alternatives were eliminated from further study during the assessment process because they either did not meet project objectives or were not feasible for other reasons. They are:

1. Conduct ground-based chemical insecticide treatment over entire proposed treatment area. This alternative would be physically and economically impossible, given the total acreage proposed for treatment and the inaccessibility of the majority of the wetlands to ground equipment. In addition, ground application has limited application range and requires a greater amount of active ingredient per given treatment area. Ground applications (fogging and resting-site barrier treatments) are already a part of the Tyndall AFB Entomology program for selective treatment in the industrial, housing, recreation areas, and on the perimeter of mosquito breeding sites. Fogging operations are based upon mosquito trap counts and complaints.
2. Mechanically manipulate marshland/wetland breeding areas through drainage or open marsh management activities. Although an effective way of eliminating mosquitoes at their source, draining or altering wetlands, other than those areas that are already covered by permits to maintain existing mosquito and drainage ditches, risks violation of Section 404 of the Clean Water Act. Creation of ditches and ponds can permanently negatively impact marshland hydrology and vegetation ecology.

2.8 DESCRIPTION OF ALTERNATIVES CONSIDERED

2.8.1 ALTERNATIVE A (No Action)

Under this scenario, no action to control mosquitoes would take place, other than measures presently used by Tyndall AFB as part of their routine pest management program (e.g., ground spraying based upon adult mosquito trap counts and complaints, reducing container breeding sources, selective breeding pool larviciding, and using repellents). Mosquito population levels would only be influenced by these and natural forces.

2.8.2 ALTERNATIVE B (Enhance only biological and biorational control measures and encourage the use of personal protective measures)

Examples of biological control measures include: stocking mosquito breeding ponds with mosquito eating fish (e.g., *Gambusia affinis*), erecting nesting boxes for insectivorous purple martins, ground-treating breeding sites with a biological control

agent (e.g., *B.t.i.* or Altosid), and eliminating container and non-wetland breeding habitat/conditions. Personal protective measures include using repellents, wearing protective clothing, and avoiding the outdoors during peak mosquito biting periods.

2.8.3 ALTERNATIVE C (Conduct aerial larval control using *B.t.i.*, limited to Tyndall AFB property and do not to exceed three applications per season)

Only contiguous wet areas having appropriate breeding habitat can be treated using the available aerial spray equipment. Three applications (or less) are stipulated to minimize disruption of wetland ecosystems. Larval stages of mosquito species that breed in containers, small pond/puddles, treeholes, and ponds covered by dense foliage would not be treatable, under this alternative.

2.8.4 ALTERNATIVE D – Proposed Action (Conduct aerial adult mosquito control using Naled, on Tyndall AFB property and the adjacent cities of Bay and Gulf Counties. Applications of this material would not exceed three treatments per season, except under medical emergency conditions.)

These control actions would be contingent upon expressed written agreement with the adjacent cities. Three applications (or less) are stipulated to minimize disruption of wetland ecosystems and excessive pesticide burden on non-target organisms. More frequent adulticide treatments would also increase the risk of the development of pesticide resistance in the target mosquitoes. In a typical season, one adulticide treatment is needed in late spring to kill the first major mosquito brood (late May early June), one to target a major mid-summer brood (June-July), and one treatment is directed toward suppressing the late season (August) brood which, in turn, reduces the over-wintering egg base. This then reduces the following year's spring brood. A medical emergency necessitating consideration of more than three treatments would consist of compelling evidence of human illness due to a locally-contracted mosquito-borne disease.



Figure 2.1

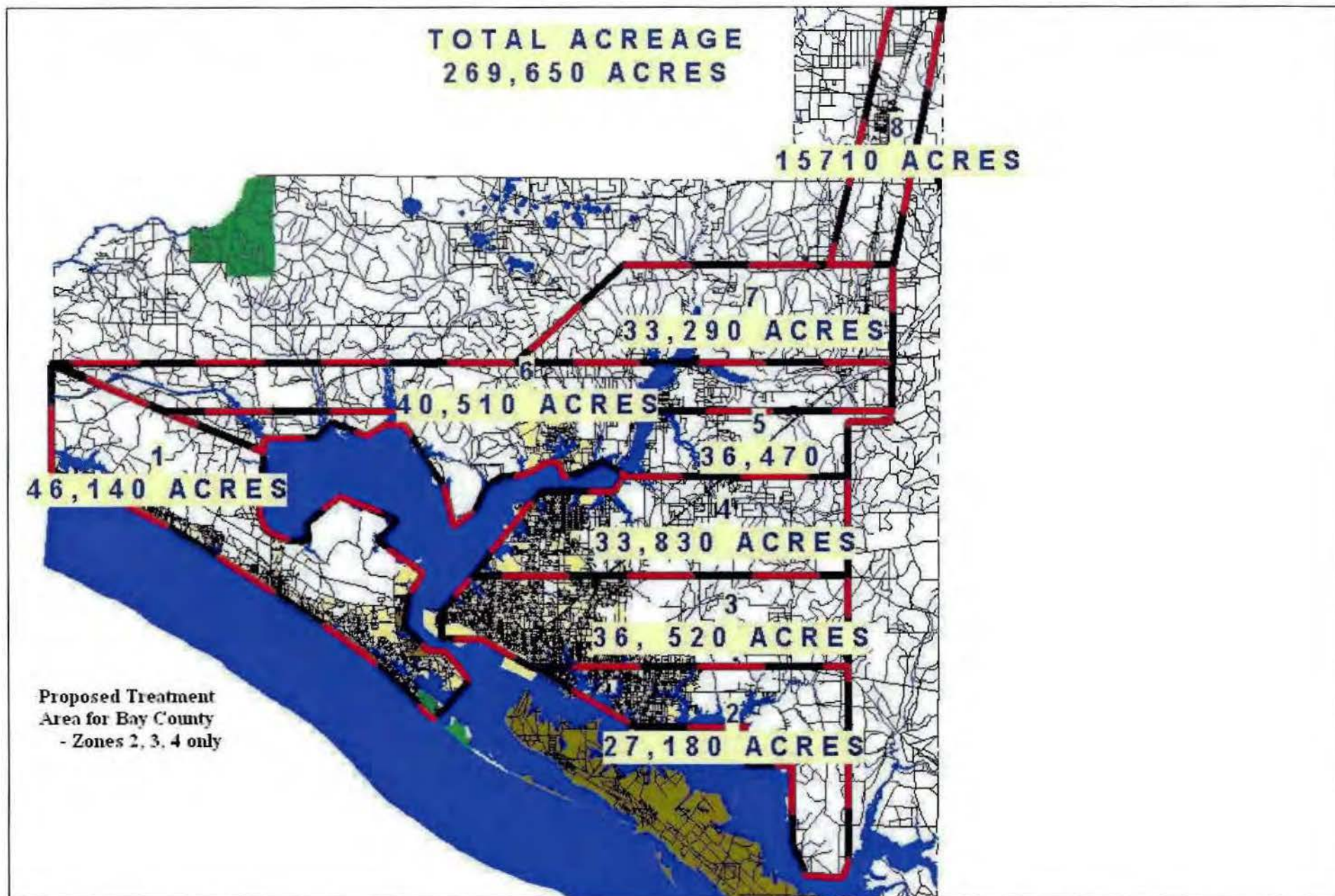
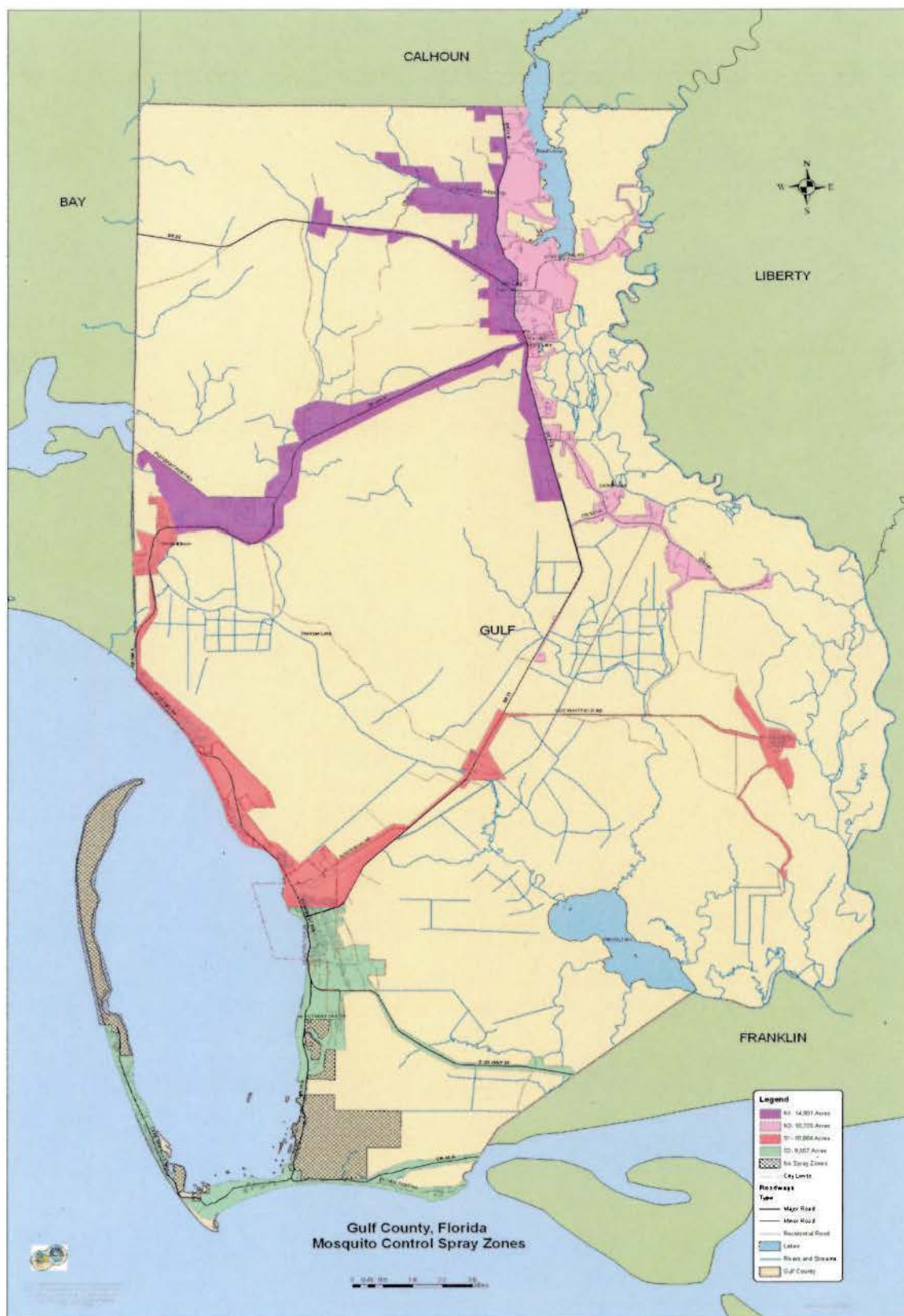


Figure 2.2



3.0 AFFECTED ENVIRONMENT

3.1 AIR QUALITY

Tyndall AFB and adjacent Counties are in the US Environmental Protection Agency (EPA), Region 4, Air Quality Control Region 005, which encompasses the entire Florida panhandle and extends east to near Tallahassee, Florida. This region coincides with Florida State Region #6 and is based on prevailing air currents.

The air quality standards which proposed actions must meet include federally-enforced standards and rules of the State of Florida, Department of Environmental Protection (DEP). To protect and enhance the air quality of Florida, the DEP has promulgated a non-degradation policy and established air quality emission standards.

The air resources of the area are influenced by the terrain and the prevailing meteorological conditions. Air pollution is frequently associated with strong ground-based inversions. However, no specific air pollution problem has been identified in the area by Florida DEP. Ground-based inversions occur at Tyndall AFB practically every morning and normally break late in the morning due to surface heating. On several days during the winter, the inversion does not break up due to a deep layer of sea fog retarding the heating. At other times during the winter, a persistent low-level inversion may exist in the area for several days due to subsiding air in a stagnating high pressure area. In addition to a damping effect of the inversion, wind speeds in these situations are light.

The air quality at Tyndall AFB and surrounding cities is good. The area is in attainment for National Ambient Air Quality Standard parameters which are regulated by the State of Florida, DEP. The regulated substances are: particulate matter larger than 10 microns (PM₁₀), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), carbon monoxide (CO), ozone (O₃), and lead (Pb).

In September 2005, the base submitted an application to FDEP to renew the Federally Enforceable State Operating Permit (FESOP). Under this FESOP, the base limits emissions to below that of a major source. Thus, the base is not subject to a Title V operating permit.

Climate

The average annual temperature at Tyndall AFB and adjacent cities is 69 degrees Fahrenheit (°F). Average monthly temperatures range from 54 °F in January to the low 80s during June, July, and August. The highest average daily maximum temperature is 89 °F in August and the lowest average daily minimum temperature is 45 °F in January. Average rainfall is approximately 56 inches. Precipitation is fairly well distributed throughout the year, with the heaviest amounts occurring June through September. Northerly winds prevail during most of the winter. Southwesterly winds from the Gulf of Mexico are predominant in the summer. The average annual prevailing wind direction is from the northeast and the annual average wind speed is six miles per hour (mph), with monthly averages ranging from five mph to seven mph.

Thunderstorms are a common occurrence year around and almost daily during the summer months. The maximum monthly occurrence of thunderstorms is associated with the summer months and is mostly the result of the sea breeze. Tyndall AFB and adjacent cities are vulnerable to tropical storms that originate in the South Atlantic and the Caribbean. The hurricane season is 1 June to 30 November.

3.2 WATER RESOURCES

Water supply

Tyndall AFB purchases its drinking water for the main Base complex from Bay County Utilities, which supplies water to the Bay County area. The primary source of water for Bay County Utilities is Deer Point Lake. All potable water in Gulf County, including the three municipal systems (Pt St. Joe, Wewahitchka, and Lighthouse Utilities Company) is pumped from groundwater wells. The main Base has four backup wells permitted for use by the State of Florida that can be used for potable water in case of emergency.

The Base owns and operates the 60-mile water distribution system that consists of mostly cast steel lines, but also includes cast iron, steel, and plastic pipe. Water is supplied to Tyndall AFB through a single pipeline that enters the Base at the Dupont Bridge. The water flows into a 5 million gallon above ground storage tank operated by Bay County on property leased by the Air Force. Water is pumped from the tank into Tyndall AFB's distribution system, which includes two elevated storage tanks. The elevated tanks have a total storage capacity of 440,000 gallons.

Groundwater

Ground water withdrawals within the effected area come primarily from the Floridan Aquifer, with the Surficial Aquifer used only slightly. Depths to groundwater at the Base range from just below land surface to 15 bls. The Surficial Aquifer is nonartesian and is not used as a source of potable water at the Base. Recharge of this Aquifer is primarily through precipitation. The Intermediate Confining Unit is a low permeability layer that separates the Surficial Aquifer from the deeper Floridan Aquifer. This confining unit consists primarily of finegrained siliciclastic deposits interlain with carbonate strata. The Floridan Aquifer consists primarily of limestone and dolomite and is approximately 1,100 feet in thickness. The upper portions of the Floridan Aquifer provide potable water for most of the Florida Panhandle.

Surface Water

Tyndall AFB and adjacent cities are located within the Choctawhatchee River Basin which drains the Choctawhatchee River southward into Choctawhatchee Bay, and eventually into the Gulf of Mexico. The surfacewater bodies that surround the Tyndall AFB peninsula and surrounding cities are St. Andrews Bay, East Bay, St Andrews Sound, and the Gulf of Mexico. These systems are hydrologically connected to Choctawhatchee Bay to the west.

3.3 BIOLOGICAL RESOURCES

Tyndall AFB and adjacent cities are located in the Southern Evergreen Forest Region of the outer West Coastal Plain. This region is typified by the presence of longleaf pine and scrub oak forests (USAF, 1989).

Due to the variety of habitats available, faunal diversity is high. An analysis of the fauna of Tyndall AFB area was conducted by the US Department of the Interior, Fish and Wildlife Service, as part of a Natural Resources Inventory of the base (US Department of the Interior 1988). The forested areas, the grasslands on the airfields, ponds, and shoreline provide a large variety of habitats.

Inventories of the Base's fish and wildlife species are based mainly on studies conducted by 325 Civil Engineer/Environmental Flight Natural Resources Element CES/CEVN. Tyndall AFB has a freshwater fisheries management program and wildlife management programs for both game and non-game wildlife species. Tyndall AFB's fisheries management program is restricted to its lakes and ponds. Fish species that are managed at Tyndall AFB include largemouth bass, bluegill and other *Lepomis* species, and channel catfish. Tyndall AFB's fish and wildlife management program has several components, including species and habitat protection; prevention of conflicts with mission-related activities; fishing, hunting, and other recreation (e.g., bird watching); education; and nuisance/invasive species control. The game wildlife species managed by Tyndall AFB are white-tailed deer, wild turkey, wood duck, mourning dove, gray squirrel, and marsh rabbit.

Listed Species

A total of 20 listed plant species and 27 listed animal species have been documented at Tyndall AFB or in its immediate vicinity (within a 50-mile radius of Tyndall AFB). Table 3-1 presents the listed species and the habitat types they utilize.

TABLE 3-1

Common Name	Scientific Name	Federal Status (USFWS)	State Status (FFWCC or FDACS)	Habitat Type
PLANTS				
Apalachicola dragonhead	<i>Physostegia godfreyi</i>		T	Wet prairie
Bog tupelo	<i>Nyssa ursine</i>	ce		Wet prairie
Chapman's butterwort	<i>Pinguicula planifolia</i>	ce	T	Wet prairie
Chapman's crownbeard	<i>Verbesina chapmanii</i>		T	Wet prairie
Decumbent pitcher plant	<i>Sarracenia purpurea</i>		T	Wet prairie, bogs

Dew thread sundew	<i>Drosera filiformis</i>		E	Wet prairie
Drummond's yellow-eyed grass	<i>Xyris drummondii</i>	ce		Wet prairie flatwoods
Giant water dropwort	<i>Oxypolis greenmanii</i>		E	Wet prairie, ditches
Godfrey's golden aster	<i>Chrysopsis godfreyi</i>	ce	E	Dunes
Gulf coast lupine	<i>Lupinus westianus</i>	ce	T	Scrub, dunes
Harper's yellow-eyed grass	<i>Xyris scabrifolia</i>		T	Wet prairie
Henry's spider lily	<i>Hymenocallis henryae</i>	ce	E	Cypress stringers
Karst pond yellow-eyed grass	<i>Xyris longisepala</i>		E	Upland lake margin
Large-leaved jointweed	<i>Polygonella macrophyli</i>	ce	T	Scrub
Parrot pitcher plant	<i>Sarracenia psittacina</i>		T	Wet prairie, bogs
Quillwort yellow-eyed grass	<i>Xyris isoetifolia</i>	ce	E	Wet prairie
Southern milkweed	<i>Asclepias viridula</i>	ce	T	Wet prairie
Southern red lily	<i>Lilium catesbaei</i>		T	Wet prairie
Spoon-leaved sundew	<i>Drosera intermedia</i>		T	Wet prairie
Thick-leaved water willow	<i>Justicia crassifolia</i>	ce	E	Wet prairie
Violet-flowered butterwort	<i>Pinguicula ionantha</i>	T	E	Cypress domes
White-flowered wild petunia	<i>Ruellia noctiflora</i>		E	Wet prairie

BIRDS

American oystercatcher	<i>Haematopus palliatus</i>		SSC	Shoreline
Bald eagle	<i>Haliaeetus leucocephalus</i>	T	T	Coastline, lakes
Black skimmer	<i>Rhychops niger</i>		SSC	Shoreline
Brown pelican	<i>Pelecanus occidentalis</i>		SSC	Barrier island, bays
Least tern	<i>Sterna antillarum</i>		T	Barrier island, shoreline
Little blue heron	<i>Egretta caerulea</i>		SSC	Marshes, ponds, lakes
Osprey	<i>Pandion haliaetus</i>		SSC	Coastline, lakes
Peregrine falcon	<i>Falco peregrinus tundrius</i>	ce	E	Open habitats
Piping plover	<i>Charadrius melodus</i>	T /CH	T	Barrier island
Reddish egret	<i>Egretta rufescens</i>		SSC	Brackish marsh shallow coastline

Snowy egret lakes, ponds,	<i>Egretta thula</i>		SSC	Marshes, lakes, ponds
Snowy plover	<i>Charadrius alexandrinus</i> ce <i>tenuirostris</i>		T	Barrier island
Southeastern American kestrel	<i>Falco sparverius paulus</i> ce		T	Open, partly open habitat
Tricolor heron	<i>Egretta tricolor</i>		SSC	Marshes, ponds
White ibis	<i>Eudocimus albus</i>		SSC	Marshes, lakes

REPTILES

Alligator snapping turtle	<i>Macrolemys temmincki</i> ce		SSC	Freshwater lakes
American alligator	<i>Alligator mississippiensis</i> T (S/A)		SSC	Lakes, marshes
Gopher tortoise	<i>Gopherus polyphemus</i> ce		SSC	Long leaf pine, sand pine scrub
Green sea turtle	<i>Chelonia mydas mydas</i> E		E	Marine, barrier island
Gulf salt marsh snake	<i>Nerodia clarkia clarkia</i> ce			Needle grass, estuaries
Kemp's ridley turtle	<i>Lepidochelys kempi</i> E		E	Marine
Leatherback sea turtle	<i>Dermochelys coriacea</i> E		E	Marine, barrier island
Loggerhead sea turtle	<i>Caretta caretta</i> T		T	Marine, barrier island

MAMMALS

Choctawatchee beach mouse	<i>Peromyscus polionotus</i> E / CH <i>allophrys</i>		E	Barrier island
Florida black bear	<i>Ursus americanus</i> ce <i>floridanus</i>		T	Swamps, forested area
Manatee	<i>Trichechus manatus</i> E		E	Marine
St. Andrews beach mouse	<i>Peromyscus polionotus</i> E		E	Barrier island

FISH

Gulf sturgeon	<i>Acipenser oxyrhyichus</i> T / CH <i>desotoi</i>		SSC	Marine, large rivers
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E - Endangered

T- Threatened

T(S/A) - Threatened by similarity of appearance

SSC - Species of Special Concern

CH - Critical Habitat Designated
Ce - Consideration Encouraged
USFWS - U.S. Fish & Wildlife Service
FFWCC - Florida Fish & Wildlife Conservation Commission
FDACS - Florida Department of Agriculture & Consumer Services

Most of the listed species occur on the barrier islands or within wetlands where interactions with the military mission are minimal. The beaches of the barrier islands are important nesting sites for loggerhead sea turtles as well as for listed shorebirds such as the least tern, black skimmer, and piping plover. The dunes are crucially important habitat for the Choctawhatchee and St. Andrews beach mice. Shell Island from the western boundary of the Base to lands end (Choctawhatchee beach mouse), all of the coastal and bay beaches (piping plover), and the entire gulf frontage from the shoreline to 1½ miles out (Gulf sturgeon) have been designated as Critical Habitat by USFWS. Additionally, all beach and dune habitats on Shell Island and Crooked Island East and Crooked Island West have been designated Critical Wildlife Areas from 1 April to 15 September by USFWS.

The USFWS and National Marine Fisheries Service (NMFS) designated the gulf sturgeon (*Acipenser oxyrinchus desotoi*) as threatened under the ESA; listing became official on 30 September 1991. The gulf sturgeon is anadromous, inhabiting and reproducing in the freshwater coastal river systems from the Suwannee River, Florida to the Pearl River system in Louisiana and Mississippi during the spring, summer and early fall and migrating into the marine waters during the winter. It's during this over wintering period that most of the gulf sturgeon feeding and growth occurs (USFWS, 2002b, 2003). The near-shore marine habitat, out to 1.9 km from shore, is considered critical habitat for gulf sturgeon. (50 CFR Part 226, March 19, 2003).

Of the five species of marine turtles found in the Gulf of Mexico, three species are known to have nested on TAFB. These species are the Atlantic green turtle, the leatherback turtle and the Atlantic loggerhead turtle. Kemp's Ridley has been known to nest in the panhandle region. However, the majority of nests on TAFB are from loggerhead sea turtles. The highest density of loggerhead nesting in Bay County occurs on TAFB. The first green turtle nesting on TAFB occurred in 1998. Until the spring of 2000, the only confirmed leatherback nests in northwest Florida had been in Franklin and Gulf counties (USAF, 2007, Biological Evaluation for the INRMP).

Critical habitat designation for the Choctawhatchee Beach Mouse (CBM) and St Andrews Beach Mouse (SABM) was published in the Federal Register on 12 October 2006 as follows: **CBM-5: West Crooked Island/Shell Island Unit** CBM-5 consists of 1,771 acres in Bay County, Florida. On Tyndall AFB this unit encompasses those portions of Shell Island east of the entrance of St. Andrew Sound east to East Pass, West Crooked Island southwest of East Bay, and east of the entrance channel of St. Andrew Sound. **SABM-1: East Crooked Island Unit** SABM-1 consists of 826 acres in Bay County, Florida. The portion of this unit on Tyndall AFB encompasses essential features of beach mouse habitat on East Crooked Island from the entrance of St. Andrew Sound to the Tyndall AFB boundary on the east.

The piping plover (*Charadrius melodus*) was federally listed as an endangered species in the Great Lakes watershed and as a threatened species elsewhere in its range on 10 January 1986. The bird's primary winter range is along the Atlantic and Gulf coasts from North Carolina to Mexico and into the Bahamas and West Indies (USFWS, 1988, 1989 as cited in USFWS, 1996). Critical habitat has been designated for piping plovers along the Gulf coast of Florida. Piping plovers are commonly found to spend winters in the eastern portion of the Florida panhandle (Franklin through Bay counties). Even though Florida has not been considered a primary wintering area for piping plover, diminishing habitat along other Gulf coast areas may be affording the piping plover new wintering grounds in Florida. Critical habitat designation for wintering and breeding grounds for the piping plover was published in the Federal Register on 10 July 2001 (Unit FL-5: Shell/Crooked Islands. The majority of the unit is within Tyndall Air Force Base and St. Andrews State Recreation Area.

The first known eagle nest on Tyndall AFB was found in 2000; there are now three known active nests on Tyndall AFB with a fourth inactive site. As prescribed burning increases, the number on nests may increase. The bald eagles food is primarily fish, either self caught or taken from osprey. Also include in the diet are crippled waterfowl, rabbits, muskrat, road killed animals and other carrion. The USFWS has established national bald eagle management guidelines for the protection of bald. These guidelines are based on the use of buffers around nesting birds. These buffers should be large enough to prevent disturbance to the nesting bird or nesting trees. No critical habitat on Tyndall AFB has been designated for the bald eagle (USFWS, 2006).

Violet-flowered butterwort is endemic to the lower Apalachicola drainage in Florida in Bay, Gulf, Franklin, and Liberty counties. It was listed as threatened by USFWS in 1993 because of habitat degradation caused by fire suppression and shading by planted pines (U.S. Fish and Wildlife Service, 1993). Violet-flowered butterwort is considered to be the rarest of *Pinguicula* species in Florida (Kral, 1983). Violet-flowered butterwort is known to occur on Tyndall AFB in three sites on the banks of roadside ditches adjacent to a remnant wet flatwoods and slash pine plantations (Knight, G.R. et al, 1994; Johnson, 2001; Mobley, J. personal observation, 2006).

Wetlands

There are many types of wetlands on Tyndall AFB and surrounding communities. Wetlands on Tyndall AFB have been mapped and classified in accordance with the USFWS's National Wetlands Inventory (NWI) classification system as described in *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et. al., 1979). Based on the NWI classification system, the predominant wetland types are estuarine and palustrine forested. The estuarine wetlands are the tidal saltmarshes within the lower reaches of the bayous along the Bay. The palustrine forested wetlands are primarily the forested floodplains of the upper reaches of the bayous.

Six areas at Tyndall AFB have been identified by the Florida Natural Areas Inventory

(FNAI) as Special Interest Natural Areas. These areas consist mostly of wetland habitat and are relatively pristine. They are considered ecologically valuable and support a variety of plants and wildlife species, some of which are rare or protected. The Proposed Action is not located within the boundary of this Special Interest Natural Area.

Coastal/Marine Habitats

Tyndall AFB's coastal/marine habitats occur along the shoreline of its peninsula and on its barrier islands (see Figures 3-1 and 3-2). The Tyndall AFB peninsula and barrier islands have a combined total of approximately 128 miles of shoreline. The barrier island system comprises approximately 2,300 acres and consists of Shell Island, Crooked Island West, and Crooked Island East. The barrier islands are subject to dramatic alteration by storms. The topography, vegetation community structure, and hydrology of the barrier islands are all in a dynamic state of fluctuation as a result. The primary habitat types on Tyndall AFB's barrier islands are beach, beach dunes, coastal grasslands, coastal dune lakes, coastal interdunal swales, scrub, and mesic flatwoods. Detailed descriptions of these habitats are provided in the Tyndall AFB INRMP. Tyndall AFB's barrier islands support a wide variety of terrestrial and aquatic wildlife, and serve as Critical Habitat for several species. The primary coastal/marine habitat on the Tyndall AFB peninsula is tidal salt marsh. Beach dune habitat is also present on the Gulf side of the peninsula. Salt marsh habitat exists along the edges of all the bayous on the bay side of the peninsula. Salt marsh also exists in low energy areas on the bay side of Shell Island. Salt marshes at Tyndall AFB are dominated by black needle rush and cord grass.

3.4 NOISE

Noise may be defined as any undesirable sound, regardless of its origin. Noise intrusion into a quiet environment would, in most cases, have greater impact than additional noise into an existing noisy environment. The most commonly used noise measurement is the Day/Night Average Sound Level (L_{dn}). The L_{dn} reflects the cumulative noise levels compiled over a 24-hour period and is weighted to account for the quieter background noise levels from 2200 to 0700, with a 10 decibel penalty applied for that period. Noises occurring at night are recognized as being more likely to disturb people than the same noise occurring during the day. The L_{dn} noise levels are expressed by a means of contour lines centered on the principal noise source. In the case of Tyndall AFB and surrounding area is the runway. Noise exposure contours are developed to be used as a planning tool for both the air operations personnel and those who plan the growth of the communities in the vicinity of the base. The numbers used in quantifying noise levels in the L_{dn} analysis are associated with different degrees of impact. Generally, noise levels of 65 L_{dn} and higher have a more pronounced impact on noise sensitive land uses and are generally incompatible with most land uses such as residential and recreational.

Noise exposure around Tyndall AFB is created by aviation activities. The current mission at Tyndall generates an average of 79 sorties per day. A sortie is defined as a mission performed by a single plane. Each sortie has an Average Sortie Duration (ASD) of 1.27 hours. The current total flying hours each day is approximately 100 hours.

Baseline analyses of noise levels at Tyndall AFB, conducted by the Air Force Engineering and Services Center, Engineering and Services Laboratory at Tyndall AFB, show that noise levels of 65 Ld_n and higher are presently being generated by aircraft using the Tyndall runway and that the projected levels of aircraft operations are expected to continue to produce noise levels of 65 Ld_n and higher.

3.5 LAND USE

Land use plans provide direction for development and improvement of Tyndall AFB. Land use planning is an effective tool in maximizing mission effectiveness, generally enhancing quality of life, and preserving quality of on-Base natural environments. Efficient utilization of the limited land available is an indication of good land use planning. Existing land use categories at Tyndall AFB consist of airfield, airfield pavements, aircraft operations and maintenance, technical training, industrial, administrative and operations, community service, medical, housing accompanied, and housing-unaccompanied (see Figures 3-3). Recreation facilities exist for base residents such as: athletic fields, playgrounds, picnic grounds, nature trails, tennis courts, swimming pools, fishing ponds, jogging courses, and golf courses.

Approximately 14,500 acres of Tyndall AFB property has been designated by FFWCC as a Wildlife Management Area (WMA). The WMA is operated by the Base in coordination with FFWCC and is available to the public for hunting and other recreation.

With respect to off-base land use, the entire region is abundant in forest and swamplands, islands, and coastal waters (Air Force, 2000). The counties in the region are primarily rural, with agriculture, timber harvesting, preservation, residential, and natural areas being the dominant land use. Off-base land use within the proposed treatment area includes extensive civilian residential communities and associated commercial and municipal resources. Surrounding residential areas are high density, ranging from single family dwellings to apartment complexes. Panama City is the largest population center in the county, as well as the largest in the region. **The proposed treatment of off-base land would take place only if the appropriate written agreements are secured between Air Force and adjacent city and county officials.**

3.6 NONTARGET ORGANISMS

From a broad perspective, nontarget organisms within the proposed treatment area include: the resident human population; domestic animals (e.g., dogs, cats, horses); woodland mammals (e.g., white-tailed deer, raccoon, opossum, squirrel); marshland animal communities (e.g., muskrat, beaver); game and non-game bird species (e.g., ducks, geese, hawks, warblers); reptiles and amphibians; a multitude of terrestrial invertebrates (e.g., beetles, flies, moths, bees, wasps, true bugs); and fresh, brackish, and saltwater fish, shellfish, crustacea, and other aquatic invertebrates.

Nontarget plants include a large variety of naturally occurring native plants. The prominent vegetation in the area includes slash pine, longleaf pine, and hardwoods such

as red maple, black willow, sweetbay water oak, black gum, and cypress. Landscaping shrubbery includes crepe myrtle, forsythia, wax myrtle, juniper, privet, and holly.

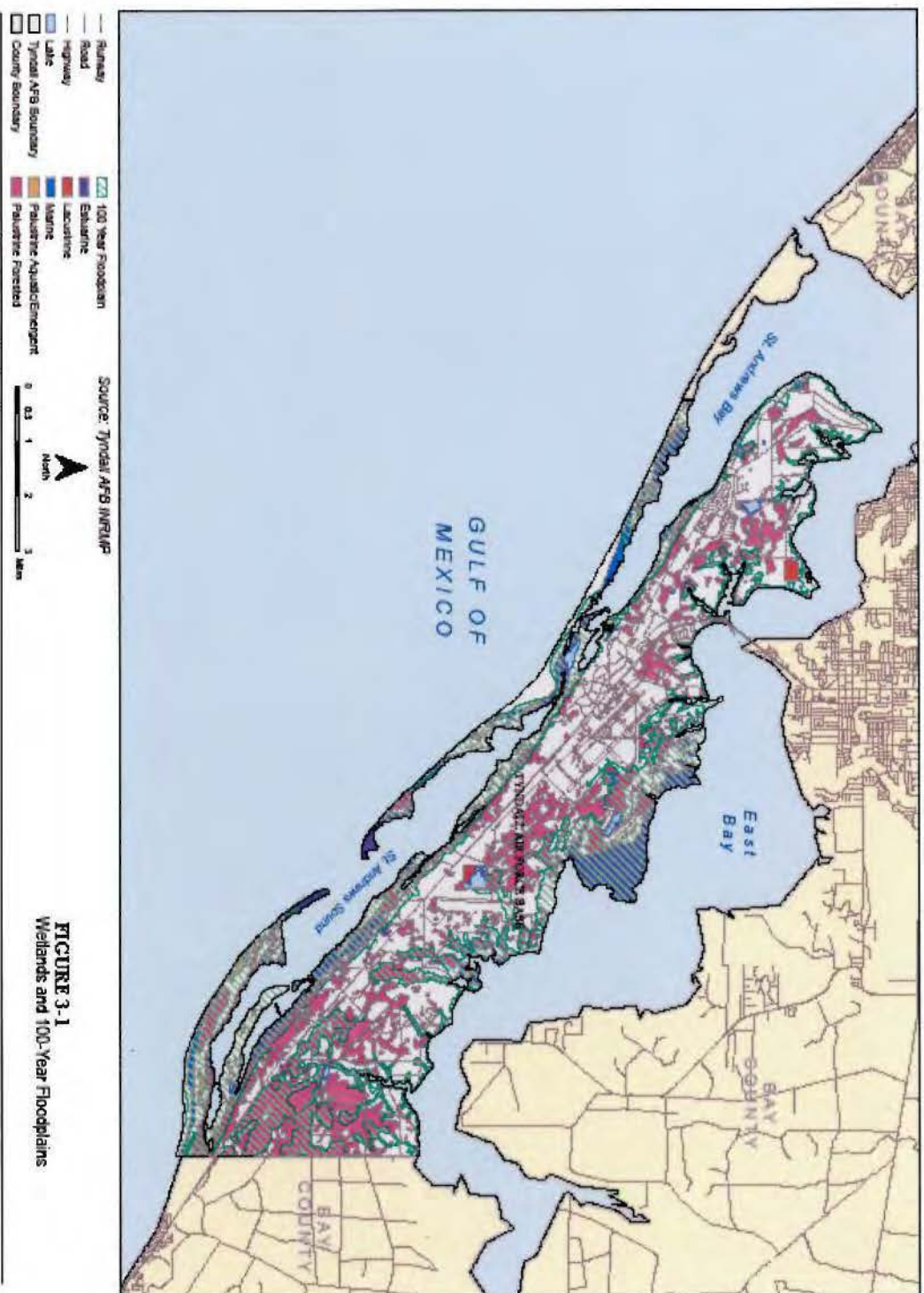
3.7 HAZARDOUS MATERIAL/SOLID WASTE

Hazardous materials are used at Tyndall AFB to support a variety of mission activities. A variety of Air Force, federal, and state regulations define the responsibility of the 325 FW, including tenant units working on base. Under current policies, no hazardous material, unless specifically exempted, will be brought onto the base until the material is authorized by the Hazardous Material Office (HAZMO).

Tyndall AFB manages solid wastes through an integrated approach that complies with regulatory requirements; meets Air Force, Florida, and Bay County solid waste diversion goals; and limits the burden on the local area. This Integrated Solid Waste Management Plan addresses residential, commercial, and industrial non-hazardous wastes and special waste stream recycling and disposal at Tyndall AFB.

3.8 COASTAL ZONE MANAGEMENT

The Coastal Zone Management Act was enacted to preserve, protect, develop, restore, and enhance the coastal zone resources, where possible. In response, Florida developed the Florida Coastal Zone Management Program administered by FDEP. There are 23 statutes under this program that protect and enhance the state's natural, cultural, and economic coastal resources.

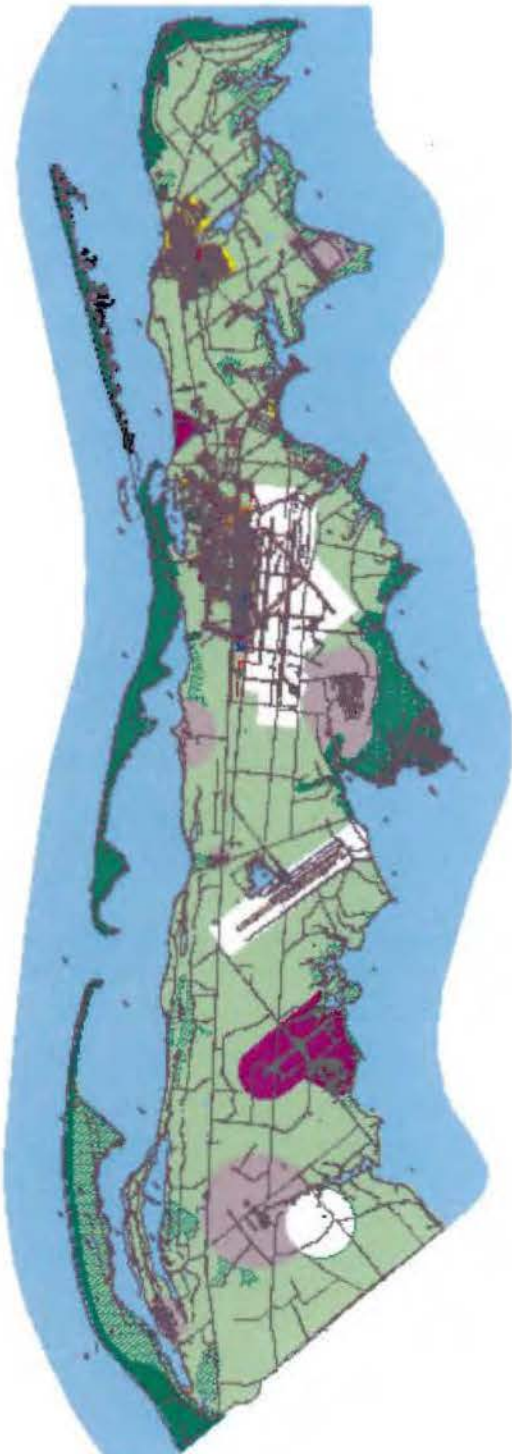




Source: Tyndal AFB General Plan



FIGURE 3-3
Existing Land Use



4.0 ENVIRONMENTAL CONSEQUENCES

4.1 AIR QUALITY

4.1.1 ALTERNATIVE A (No Action)

The No Action alternative would not have any air quality impact. There would be no violation of the National Ambient Air Quality Standards. Under these circumstances, any concerns about the aerial application of insecticides and the effects that may result from such treatment on the environment, would be eliminated.

4.1.2 ALTERNATIVE B

Tyndall AFB and adjacent cities are in an attainment area for National Ambient Air Quality Standard. Under this alternative the air quality in the area would not be affected since no air pollutant would be used.

By increasing/enforcing personnel protection measures, the individual risk of contracting a mosquito-borne disease and the mosquito biting annoyance, are reduced. Difficulties relating to the issues of practicality and convenience arise when trying to encourage non-service personnel to practice preventive measures such as curtailing outdoor activities, wearing long sleeves and long pants during hot outdoor temperatures, and being judicious in the application of repellent.

4.1.3 ALTERNATIVE C

Tyndall AFB and adjacent cities are in an attainment area for National Ambient Air Quality Standard. Under this Alternative, the FESOP permit for Tyndall AFB would not be violated. The spray would be released in very fine droplets that are small enough to remain in the air, yet potent enough to kill insects on contact. The amount of active ingredient that would be released is small in comparison to the size of the area treated. This small quantity would help to minimize exposure and risks to people and the environment.

Although interruption in a potential mosquito-borne disease cycle would take place under this alternative, all biting species of mosquitoes would not be eliminated because of the discrete and untreatable breeding habitats of some. Migration of adult biting mosquitoes onto Tyndall AFB and surrounding communities from sizable untreated areas nearby would still be expected.

4.1.4 ALTERNATIVE D (Proposed Action)

As indicated in Section 3.2, Tyndall AFB and adjacent communities are in an attainment area for National Ambient Air Quality Standard parameters. National Ambient Air Quality Standards would not be violated by the implementation of the proposed action. The

recommended ULV aerial dispersal rate for naled generates droplets which are between 10 and 40 microns. Depending on the climatological conditions, these droplets settle to the earth in a matter of a few hours. There would be temporary increases in volatile organic compounds and nitrous oxides within the proposed treatment area as a result of the proposed action. However this activity would not exceed local standards for air emissions and would not result in nonconformance with the Clean Air Act and its amendments. It is recognized that ULV sprays can be inhaled by humans and other vertebrates. For this reason, base and surrounding communities residents would be notified of spray timing, in order to minimize undue inhalation exposure. Careful attention would also be paid by the applicators to avoid drift into non-target areas.

The spray droplets of the wettable powder formulation of *B.t.i.* at the recommended rate of 6-12 ounces in 1/4 to 10 gallons of water per acre would settle to the water surface within minutes of application, and would, therefore, only transiently affect the quality of the immediate air space.

In summary, the aerial spraying of naled would only temporarily affect the local air quality. Droplets of naled settle to the ground, water, or vegetative substrate, within hours, where they rapidly begin to biodegrade and hydrolyze.

4.1.5 MITIGATION

Aerial application would be conducted only when atmospheric conditions are as follows: winds less than 10 mph; low thermal activity; temperature ideally less than 80°F; humidity greater than 50 percent. A conformity determination would not be required. The number of sprays would be limited to no more than three per season.

4.2 WATER QUALITY

4.2.1 ALTERNATIVE A (No Action)

The No Action alternative would not have any water quality impact. Under this Alternative, any concerns about the aerial application of insecticides and the effects that may result from such treatment on the environment, would be eliminated. The No Action Alternative would have no effect on water supply, groundwater, or surface water.

4.2.2 ALTERNATIVE B

Tyndall AFB purchases its drinking water from Bay County Utilities, which supplies water to the Bay County area. There are no portable surface bodies of water within the base. Under this Alternative, no insecticides would be applied. For these reasons, this Alternative would not have a significant impact on water quality.

4.2.3 ALTERNATIVE C

Tyndall AFB purchases its drinking water from Bay County Utilities, which supplies water to the Bay County area. There are no portable surface bodies of water within the spray area. This alternative will have no impact on the groundwater because the project will not withdraw or impact any water from the Sand and Gravel or Floridan Aquifers.

Although the *B.t.i.* active agent is stable in water for more than 30 days, it would gradually settle out and become enmeshed, embedded, or attached to bottom substrate. It may also be consumed by other aquatic organisms thereby being a food source providing protein without ill effects, according to one manufacturer (Biochem Products, undated). Water quality, would not, therefore, be negatively affected.

4.2.4 ALTERNATIVE D (Proposed Action)

In the proposed concentration, naled would have no impact on the water quality of the area. Naled is nearly insoluble in water. Hydrolysis of the compound is initiated immediately upon contact with moisture, and the breakdown is proportional to the temperature and pH of the water. AT 25⁰ C the half-life of naled in water is 15.4 hours at pH7 (Valent, 1995). Naled half-life in soil is ≤ 8 hours (EPA 1983) and is undetectable after one day under either aerobic or anaerobic conditions (Chen 1984). Under normal circumstances, most of the applied naled (and its major decomposition products) would be degraded within 24 hours of application (Chevron 1975, Valent 1995). The material is applied by ULV at a rate of 0.6 to 1.2 ounces per acre, thereby eliminating the possibility of runoff onto nontarget areas due to application procedures. Limited data indicate that the rapid dissipation and relatively low mobility of naled and intermediate mobility of DDVP (a degradate of naled) in soil would mitigate contamination of ground water (EPA 1983).

Water quality, would not, therefore, be negatively affected.

4.2.5 MITIGATION

Precautions would be taken to avoid potential pesticide drift to surface bodies of water during application. All reservoir officials in the proposed area would be notified prior to a planned treatment so they can monitor specifically for naled, if circumstances warrant, to detect any potential pesticide residues which might be attributable to a misapplication or drift. The number of sprays would be limited to no more than three per season.

4.3 BIOLOGICAL RESOURCES

4.3.1 ALTERNATIVE A (No Action)

Under these circumstances, any concerns about the aerial application of insecticides and the effects that may result from such treatment on the environment, would be eliminated. Non-target insects, particularly other Diptera and Hymenoptera (e.g,

Honeybees), would not be effected. Large-scale intervention in a potential mosquito-borne disease cycle would not take place. A noticeable decline in mosquito populations, especially *Aedes sollicitans*, and a noticeable reduction in mosquito biting annoyance levels to the human population, other than those that might occur naturally, would not be realized. The late-fall egg base of *Aedes sollicitans* would not be reduced which typically results in a large emergence in the spring of the following year.

4.3.2 ALTERNATIVE B

Reducing artificial container-breeding habitat (cleaning up waste tires, cans, water-holding refuse; changing water in bird baths) and using a ground applied (e.g., by hand) biological control agent such as *B.t.i.*, would help to reduce the numbers of several species of biting mosquitoes (e.g., *Culex salinarius*, *Culex restuans*, *Culex pipiens*, *Psorophora columbiae*). Source reduction would not have impact on salt marsh species (e.g., *Aedes sollicitans*, *Aedes taeniorhynchus*) and ground-based application of a biological control agent to salt marsh habitat would be limited, due to physical inaccessibility.

Larvivorous fishes already reportedly breed in some pools within the region. Colonization of these fish at other pools would likely help to reduce mosquito numbers. Some mosquito species breed in habitats that are unsuitable for the introduction of such fish (e.g., artificial or temporary water sources) and would not be affected. Also, attention must be paid in using only endogenous fish species because negative environmental effects on native fish and vegetation may result from introducing non-local fish (Haas, 1984).

Insectivorous animals such as bats and birds can be encouraged to proliferate in a given vicinity by erecting suitable nesting structures. Claims are often made of the large quantity of mosquitoes eaten by these species, but quantifiable evidence of mosquito population reductions which are attributable to this species, is lacking. It should be noted that their diet also consists of neutral, or even beneficial insects, such as wasps and dragonflies (Bent, 1942). It should also be noted that it may not be wise to encourage bat proliferation in close proximity to human activities due to their propensity to harbor the rabies virus.

4.3.3 ALTERNATIVE C

Under this Alternative, contiguous marsh and wet mosquito breeding areas would be targeted for treatment. First through early fourth instar mosquito larvae of fresh and marsh mosquitoes, particularly *Aedes dorsalis* and *Aedes vexans* would succumb within 24 hours of ingesting the *B.t.i.* proteinaceous parasporal particle. Some immature stages of midges (e.g., *Chironomus spp.* and *Dixa spp.*) would also be killed upon ingestion of the material. The persistence of *B.t.i.* activity is usually no more than two days under typical mosquito abatement use conditions, so the effect on non-target midge

populations would be temporary. No adult non-target insects and only a few species of non-target subadult diptera would be affected.

A summary of safety tests on vertebrate and invertebrate nontarget organisms compiled by one *B.t.i.* manufacturer (Biochem Products) showed that, other than producing mortality in some species of flies and midges; no ill effects were detected in close to 100 different nontarget invertebrates. Similar results were obtained by Garcia (1980). Additionally, if a yet-unknown nontarget food species were to be negatively impacted, the food habits of rail species appear to be diverse. Examples of food items include; immature and adult insects, snails, crustaceans, mollusks, annelids, and small amphibians and fish (Bent 1926). Finally, the proposed limit of no more than three applications per season would allow populations of the small number of affected nontarget taxa to recover, something which otherwise might prove more difficult under more frequent treatments.

A study examining the nontarget effects of *B.t.i.* on stream invertebrates communities and fish (Merritt 1989), found no significant effects. Another study (Lee 1989) revealed that *B.t.i.* was less toxic to nontarget fish (*Fundulus heteroclitus*) than four other chemical larvicides. A point to consider when weighing the effects of reducing mosquito numbers in a marsh ecosystem is that competing nontarget "non pest" organisms can be expected to fill the ecological niche normally occupied by "pest" mosquito larvae and could, in some cases, benefit ecologically from intervention.

Based upon EPA's scientific findings (EPA, 1990), data gaps do exist in the ecological effects data base for *B.t.i.*, mainly relating to strain specificity. There are, however, no substantial environmental safety concerns and no substantive concerns regarding unreasonable adverse effects. Certain endangered lepidopteran (butterflies, skippers, moths) insect species can be affected by the *kurstaki* strain, but this strain differs from dipteran-specific *israelensis* strain and endangered lepidopteran species are not known to occur in the proposed treatment area.

There is no evidence to suggest that *B.t.i.* is toxic to, or otherwise affects, honey bees or honey bee products.

4.3.4 ALTERNATIVE D (Proposed Action)

Naled

Smith (1987) summarized the persistence and hazard evaluation of Naled on wildlife and concluded that Naled has low environmental persistence, which may minimize prolonged exposure to wildlife. Additionally, no reported incidences of wildlife problems are attributable to Naled, even though Naled is commonly used in areas that provide wildlife habitat.

Additional Laboratory test results of the effects of Naled on four species of freshwater organisms and three species of estuarine organisms determined that although its toxic effects ranged from moderately to very highly toxic, under true environmental conditions, this material can be used without adversely affecting non target aquatic organisms (Valent, 1995).

According to the US EPA's Naled Summary published in 1999, "Acute and chronic risk to freshwater and estuarine fish is not expected. There is potential for acute and some potential for chronic risks to freshwater invertebrates from all major uses of Naled." Naled used in mosquito control programs does not pose unreasonable risks to wildlife or the environment (Florida Department of Agriculture & Consumer Services, 2004). Naled degrades rapidly in the environment and it displays low toxicity to birds and mammals (USEPA 2002). Acute and chronic toxicity to fish is not expected based on the low application rate used for mosquito control. There is potential for adverse effects to aquatic invertebrates from repeated use of Naled; however, EPA has established specific precautions on the label to reduce such risk. Naled is considered toxic to bees. Droplets of the sprayed chemical are capable of contacting and killing foraging bees. However, there are no apiaries or commercial pollination activities in the spray area and applications will be made near sunset when bee activity is reduced or absent.

Aerial treatment with the proposed materials would not harm the known listed avian endangered or threatened species in the area. A reduction in adult mosquitoes/flying insect numbers due to treatment would have negligible impact on the base and surrounding communities -ranked bird species in the proposed treatment area due to the type, diversity, and availability of organisms that they are known to feed upon. The nesting success of these avian species would not be impacted by disturbance because it is likely that birds in the vicinity are acclimated to aircraft presence due to the already-existing high volume of air traffic.

In summary, based upon currently available information, the proposed treatment using Naled should not significantly impact wildlife and non-target organisms due to these materials' target specificity, mode of action, low persistence, rapid biodegradability, and limited numbers of applications.

4.3.5 MITIGATION

The number of sprays would be limited to no more than three per season, to further limit the pesticide burden which may be experienced by the ecosystem. All environmentally sensitive areas will be identified on the spray map and an exclusion zone for treatment would be designated. Apiaries and sensitive individuals will be identified and public notifications will be carried out by the installation Public Affairs Office prior to any aerial spraying.

Personnel from the U.S. Fish and Wildlife Service (USF&WS) have expressed concerns regarding the potential impact of aerial spray operations on the following federally listed

species: the Panama City crayfish (*Procambarus econfinae*); the Snowy Plover (*Charadrius alexandrinus tenuirostris*); the Piping Plover (*Charadrius melodus*) re-cockaded woodpecker (*Picoides borealis*); beach mice and migratory birds. All the species indicated would not be impacted due to the designated exclusion of these sites from treatment.

4.4 NOISE

4.4.1 ALTERNATIVE A (No Action)

Under this Alternative, any concerns about the aerial application of insecticides and the effects that may result from such treatment on the environment, would be eliminated. The No Action Alternative would have no effect on Noise.

4.4.2 ALTERNATIVE B

No adverse impact related to Noise would be encountered. However, under this alternative, Tyndall AFB would not be able to effectively control mosquito populations.

4.4.3 ALTERNATIVE C

The only source of noise associated with this proposed action would be that caused by the low level flying of aircraft during pesticide application. The noise levels generated by a C-130H aircraft flying at 200 feet have been evaluated using the U.S. Army Center for Health Promotion and Preventive Medicine's NOISESLICE computer program. The predicted noise from the proposed aerial spray operations was measured using a parameter called an A-weighted Day Night Level (ADNL) which closely resembles the frequency response of human hearing and, therefore, provides a good indication of the impact of noise produced by transportation activities.

Values of 50.6 decibels A-weighted (dBA) for one overflight and 60.1 dBA for ten overflights, were calculated. These levels are determined to be compatible with noise-sensitive land uses and fall within Noise Zone I, as defined by the Department of Army's Installation Compatible Use Zone (ICUZ) Program. The Zones are defined as; Zone I - compatible (<65 dBA), Zone II - normally incompatible (65-75 dBA), and Zone III - incompatible (>75 dBA).

Although the magnitude of sound generated by a C-130H can appear great, the impact should be minimal due to the short duration of the noise exposure and since advance notice of the operation would be given area personnel. Also, due to the prominence of the flight line at Tyndall AFB air traffic is commonplace in the vicinity and, therefore, a certain degree of acclimation exists among the vicinity's human and faunal population.

4.4.4 ALTERNATIVE D

The only source of noise associated with this proposed action would be that caused by the low level flying of aircraft during pesticide application. The noise levels generated by a C-130H aircraft flying at 200 feet have been evaluated using the U.S. Army Center for Health Promotion and Preventive Medicine's NOISESLICE computer program. The predicted noise from the proposed aerial spray operations was measured using a parameter called an A-weighted Day Night Level (ADNL) which closely resembles the frequency response of human hearing and, therefore, provides a good indication of the impact of noise produced by transportation activities.

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Although the magnitude of sound generated by a C-130H can appear great, the impact should be minimal due to the short duration of the noise exposure and since advance notice of the operation would be given area personnel. Also, due to the prominence of the flight line at Tyndall AFB air traffic is commonplace in the vicinity and, therefore, a certain degree of acclimation exists among the vicinity's human and faunal population.

4.4.5 MITIGATION

No adverse effects would be anticipated. Therefore, no mitigation would be required.

4.5 LAND USE

4.5.1 ALTERNATIVE A (No Action)

The No Action Alternative would have no effect on Land Use.

4.5.2 ALTERNATIVE B

This alternative would have no effect on Land Use.

4.5.3 ALTERNATIVE C

This alternative would have no effect on Land Use.

4.5.4 ALTERNATIVE D

This alternative would have no effect on Land Use.

4.5.5 MITIGATION

No impacts would be anticipated. Therefore, no mitigation would be required.

4.6 NONTARGET ORGANISMS

4.6.1 ALTERNATIVE A (No Action)

Under this Alternative, any concerns about the aerial application of insecticides and the effects that may result from such treatment on the environment, would be eliminated.

4.6.2 ALTERNATIVE B

This alternative would have no effect on Non Target Organisms.

4.6.3 ALTERNATIVE C

Under this alternative, application over human populated areas and residences would be minimal. Wild or cultivated bee colonies would not be affected and notification of beekeepers, therefore, would not be mandatory. No adult non-target insects and only a few species of non-target subadult diptera would be affected. The proposed limit of no more than three applications per season would allow populations of the small number of affected nontarget taxa to recover, something which otherwise might prove more difficult under more frequent treatments.

4.6.4 ALTERNATIVE D

The most likely group of nontarget organisms that would be potentially affected by the proposed adulticide treatment would be other insects. Flying insects, especially those belonging to the Order Diptera (true flies; e.g., crane flies, black flies, midges, gnats, marsh flies, deer flies, muscoid flies) would likely be killed upon direct contact with the adulticide spray material. Bees and wasps (Hymenoptera), dragonflies and damselflies (Odonata), and moths and butterflies (Lepidoptera) would also be affected upon contact with the insecticide. Foraging bees and bees in unprotected beehives would be killed, necessitating careful coordination with beekeepers.

Naled is a human skin irritant, eye irritant, and may cause allergic skin reactions after prolonged and repeated contact. Serious toxicological health effects can occur in humans, if exposed to high enough concentrations and under prolonged duration. This would most likely occur as a result of occupational exposure due to mishandling of the material. It is therefore essential that all of the precautions set forth on the label (App E) and on the MSDS (App F) be strictly followed.

According to EPA officials, additional data, including human toxicology data, has been submitted to EPA by the manufacturer of naled, to fulfill reregistration requirements. These additional data have not triggered a Special Review (SR) process of naled by EPA. This suggests that no significant health risks are associated with this material, if used at the recommended label rate. The EPA is in the process of writing a Registration Eligibility Decision (RED).

In 1988 EPA initiated a SR of DDVP, a metabolite of naled in plants and animals, based on concerns regarding possible cancer and toxicologic effects. While EPA is requesting data from the manufacturer to determine the potential exposure to DDVP resulting from use of products containing naled, EPA has expressed minimal concern over continued use of naled (Valent 1995). Good management practices would still require that prudent effort should be made to notify residents within the treatment area prior to application so that those conducting outdoor activities during that time can minimize unnecessary inhalation and dermal exposure to the pesticide.

Naled would not harm pets or livestock animals at the recommended application rate. In fact, the label specifically allows treatment of livestock pastures, feedlots, and pastures including dairy cattle and indicates that it is not necessary to avoid farm buildings, dairy barns, and feed or forage areas. In animals and plants, Naled degrades rapidly to dichlorvos, which in turn degrades rapidly to innocuous products (Chen, 1984).

Naled is corrosive and may harm certain automobile finishes if large droplets occur. The recommended droplet size for ULV aerial treatment of naled is 30-80 microns, with less than 5% of the droplets being 80 microns. Painted finishes should not be affected by droplets that size. This would be ensured by careful equipment calibration, stringent equipment maintenance, and quality control, all of which are USAir ForceReserve standard practices.

At the proposed rate of application, no evidence exists which suggests that naled would harm trees, plants or garden crops or that residues resulting from mosquito control would exceed established tolerances for raw agricultural commodities (EPA 1983, 1990). At the prescribed rate, no phytotoxic activity has been documented that would suggest harm to plants.

4.6.5 MITIGATION

All available means would be used to evaluate the potential local threat of mosquito-borne diseases. If such disease threats exist, the public would be notified, through all available means, of the appropriate measures and alternatives which would be used to reduce such risks. If aerial treatment is involved, the public would be notified by print and electronic media with sufficient time to allow for planning to minimize exposure during pesticide application. Measures such as remaining indoors or making plans to be away from the treatment area during the application process, can be taken.

The application would be timed so as to not coincide with schoolchildren being outdoors during the school year.

Operational exposure to the insecticide would, by far, have the highest potential degree of human exposure during this project. Stringent pesticide mixing and loading precautions and label directions would be followed to minimize human exposure to pesticides at the storage facility, during pesticide transport, and at the aircraft loading site. Impervious protective clothing, gloves, apron, overshoes, chemical goggles, face shields, and NIOSH approved respirators would always be used by workers handling the pesticides. All employees handling pesticides would have received hazard communication training and would have available to them labels and MSDS's for the pesticides used. The enzyme cholinesterase levels of personnel handling naled would be monitored to detect undue exposure, as part of required Air Force occupational health medical surveillance programs.

Naled is highly toxic to bees. Any Beekeeper in the area can, upon notification, protect their bees from the effects of naled by either closing/covering their hives with burlap or dark plastic for 1 to 2 hours during and after treatment. Colonies may be covered for as long as 2 days if the burlap is kept wet (Dadant and Sons 1975). Running a mist nozzle (water curtain) over hives is another accepted practice that discourages bees from leaving the hive as well as dilutes and washes away any potential pesticide residues to harmless levels. Due to the rapid degradation of naled, protecting bees for 24 hours after treatment should be adequate in preventing mortality. Timing the proposed application to as close to sunset as possible should also reduce mortality of foragers, not only in cultivated hives but also on wild colonies. United States Air Force Fact Sheet entitled "Mosquito Spray Flight Information for Beekeepers" was published to aid area beekeepers in minimizing honey bee loss. This publication is available from the Tyndall AFB Public Affairs Office.

4.7 HAZARDOUS MATERIAL/SOLID WASTE

4.7.1 ALTERNATIVE A (No Action)

The No Action Alternative would have no effect on use of hazardous material or generation of solid waste.

4.7.2 ALTERNATIVE B

Under this alternative, any chemical usage would be tracked and disposed of in accordance with state and federal regulations.

4.7.3 ALTERNATIVE C

Pesticide containers would be triple rinsed with the designated spray carrier, rendered unusable, and disposed of in accordance with state and federal regulations. The usage of pesticide will be authorized and tracked by the HAZMO office.

4.7.4 ALTERNATIVE D

Naled pesticide containers would be triple rinsed with the designated spray carrier, rendered unusable, and disposed of in an approved landfill. Under no circumstances would the containers be used for any other purpose. The rinsate would be added to the mix tank. Any contaminated protective equipment would be handled as hazardous waste. The usage of pesticide will be authorized and tracked by the HAZMO office.

4.7.5 MITIGATION

Spill containment and appropriate cleanup materials would be present at the pesticide storage site, during pesticide transport, and at the loading site, to prevent environmental contamination due to an accidental spill. Any rinse material used to clean spray equipment would be handled in accordance with state and federal regulations.

Pesticide would be transported from the storage site to the aircraft loading site in vehicles that are equipped with spill containment and cleanup materials and with a separate cab and cargo section. The base hazardous material (HAZMAT) response teams would be contacted prior to and during the operation for HAZMAT contingency planning.

At the loading site, all valves, hoses, connections, pumps, and barrels would be inspected and maintained to prevent spillage and human exposure. For naled loading a vapor containment system will be utilized. DoD personnel certified in aerial application of pesticides would be present and supervise the mixing and loading of pesticide materials.

4.8 COASTAL ZONE CONSISTENCY

Statute	Consistency	Scope
Chapter 161 <i>Beach and Shore Preservation</i>	The proposed project would not adversely affect beach and shore management, specifically as it pertains to: <ul style="list-style-type: none"> • The Coastal Construction Permit Program. • The Coastal Construction Control Line (CCCL) Permit Program. • The Coastal Zone Protection Program. 	Authorizes the Bureau of Beaches and Coastal Systems within DEP to regulate construction on or seaward of the states' beaches.
Chapter 163, Part II <i>Growth Policy; County and Municipal Planning; Land Development Regulation</i>	The proposed action would not affect local government comprehensive plans.	Requires local governments to prepare, adopt, and implement comprehensive plans that encourage the most appropriate use of land and natural resources in a manner consistent with the public interest.
Chapter 186 <i>State and Regional Planning</i>	The proposed action would not have a negative affect on state plans for water use, land development or transportation.	Details state-level planning requirements. Requires the development of special statewide plans governing water use, land development, and transportation.
Chapter 252 <i>Emergency Management</i>	The proposed action would not increase the state's vulnerability to natural disasters. Emergency response and evacuation procedures would not be impacted by the proposed action.	Provides for planning and implementation of the state's response to, efforts to recover from, and the mitigation of natural and manmade disasters.
Chapter 253 <i>State Lands</i>	The proposed action would not have a negative affect to state or public lands.	Addresses the state's administration of public lands and property of this state and provides direction regarding the acquisition, disposal, and management of all state lands.
Chapter 258 <i>State Parks and Preserves</i>	State parks, recreational areas and aquatic preserves would not be affected by the proposed action.	Addresses administration and management of state parks and preserves (Chapter 258).
Chapter 259 <i>Land Acquisition for Conservation or Recreation</i>	Tourism and outdoor recreation would not be affected.	Authorizes acquisition of environmentally endangered lands and outdoor recreation lands (Chapter 259).
Chapter 260 <i>Recreational Trails System</i>	Opportunities for recreation on state lands would not be affected.	Authorizes acquisition of land to create a recreational trails system and to facilitate management of the

		system (Chapter 260).
Chapter 375 <i>Multipurpose Outdoor Recreation; Land Acquisition, Management, and Conservation</i>	Opportunities for recreation on state lands would not be affected.	Develops comprehensive multipurpose outdoor recreation plan to document recreational supply and demand, describe current recreational opportunities, estimate need for additional recreational opportunities, and propose means to meet the identified needs (Chapter 375).
Chapter 267 <i>Historical Resources</i>	The proposed action would not have an impact on historic and/or cultural resources.	Addresses management and preservation of the state's archaeological and historical resources.
Chapter 288 <i>Commercial Development and Capital Improvements</i>	The proposed action would not have an effect on future business opportunities on state lands, or the promotion of tourism in the region.	Provides the framework for promoting and developing the general business, trade, and tourism components of the state economy.
Chapter 334 <i>Transportation Administration</i>	The proposed project would not have an impact on transportation.	Addresses the state's policy concerning transportation administration (Chapter 334).
Chapter 339 <i>Transportation Finance and Planning</i>	The proposed project would have no effect on the finance and planning needs of the state's transportation system.	Addresses the finance and planning needs of the state's transportation system (Chapter 339).
Chapter 370 <i>Saltwater Fisheries</i>	The proposed action would not have an effect on saltwater fisheries.	Addresses management and protection of the state's saltwater fisheries.
Chapter 372 <i>Wildlife</i>	The proposed action would not have a negative impact on wildlife resources.	Addresses the management of the wildlife resources of the state.
Chapter 373 <i>Water Resources</i>	The proposed action would not have an impact on water resources.	Addresses the state's policy concerning water resources.
Chapter 376 <i>Pollutant Discharge Prevention and Removal</i>	The proposed action will not have an impact on the transfer, storage, or transportation of pollutants.	Regulates transfer, storage, and transportation of pollutants, and cleanup of pollutant discharges.
Chapter 377 <i>Energy Resources</i>	Energy resource production, including oil and gas, and the transportation of oil and gas, would not be affected by the proposed action.	Addresses regulation, planning, and development of oil and gas resources of the state.
Chapter 380 <i>Land and Water Management</i>	Under the proposed action, development of state lands with regional (i.e. more than one county) impacts would not occur. No changes to coastal infrastructure such as capacity	Establishes land and water management policies to guide and coordinate local decisions relating

	increases of existing coastal infrastructure, or use of state funds for infrastructure planning, designing or construction would occur.	to growth and development.
Chapter 381 <i>Public Health, General Provisions</i>	The proposed action does not involve the construction of an on-site sewage or treatment system.	Establishes public policy concerning the state's public health system.
Chapter 388 <i>Mosquito Control</i>	The proposed action would not affect mosquito control efforts.	Addresses mosquito control effort in the state.
Chapter 403 <i>Environmental Control</i>	The proposed action would have no impact on water quality, air quality, pollution control, solid waste management, or other environmental control efforts.	Establishes public policy concerning environmental control in the state.

5.0 CUMULATIVE IMPACTS

A "cumulative impact" is defined in 40 CFR 1508.7 as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non- Federal) or person undertakes such other actions." Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Based on the findings of this EA, implementation of the Proposed Action would not result in significant direct or indirect impacts to any environmental, physical, cultural, or socioeconomic resource. The use of best management practices and protective measures during their implementation minimizes their potential to impact the environment.

Potential cumulative impacts to regional air quality would be short term and insignificant. The anticipated low levels of emission from the Proposed Action and the future projects would not occur at the same time; therefore, no cumulative issues associated with air emissions would apply.

Given the limited and short-term nature of the project, no cumulative impacts to surface water or groundwater quality would be anticipated.

Proposed Action would not result in significant cumulative effects to native wildlife species. All environmentally sensitive areas will be identified on the spray map and only sprayed if proper approval is obtained. Apiaries and sensitive individuals will be identified and public notifications will be carried out by the installation Public Affairs Office prior to any aerial spraying.

No cumulative effects to the state's Coastal Zone Management Program have been identified.

6.0 LIST OF PREPARERS

Jose J Cintron, Environmental Planning Lead, 325 CES/CEV, Tyndall AFB, Florida
Wesley Westphal, Natural Resources Manager, 325 CES/CEVN, Tyndall AFB, Florida
Jack Mobley, Wildlife Biologist, 325 CES/CEVN, Tyndall AFB, Florida
Steve McLellan, Chief, Environmental Compliance, Tyndall AFB
Mr. Benedict B. Pagac, Jr., Entomologist, U.S. Army Center for Health Promotion and Preventive Medicine
Allen P. Richmond, Command Biologist, HQ AETC/A7CAN, Randolph AFB, Texas
Mark Breidenbaugh, Research Entomologist, Youngstown Air Reserve Station
Robert F. Bushway, Entomologist, Tyndall AFB, Florida

7.0 LIST OF AGENCIES AND OTHERS CONSULTED REGARDING THE PROPOSED ACTION

Coordination with State of Florida environmental agencies, such as the Department of Environmental Protection, would be through the State Clearinghouse. All other interested persons would be notified through the Public Notice process.

8.0 REFERENCES

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USAF, 2003 Environmental Assessment for the Aerial Dispersal of Pesticide for Mosquito Control at Minot AFB

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9.0 ACRONYMS AND ABBREVIATIONS

ADNL	A-weighted day night level
AFB	Air Force Base
AFI	Air Force Instruction
ARPA	Archaeological Resources Protection Act
ASD	Average Sortie Duration
BlS	below land surface
<i>B.t.</i>	<i>Bacillus thuringiensis</i>
<i>B.t.i.</i>	<i>Bacillus thuringiensis</i> variety <i>israelensis</i>
<i>B.t.k.</i>	<i>Bacillus thuringiensis</i> Lepidoptra specific strain
<i>B.s.</i>	<i>Bacillus sphaericus</i>
CAA	Clean Air Act
CBM	Choctawatchee beach mouse
CDC	Centers for Disease Control
CEQ	President's Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CWA	Clean Water Act
CY	calendar year
CZMA	Coastal Zone Management Act
dBA	decibel A-weighted
DDVP	Dichlorvos (a metabolite and degradate of Naled)
DEET	N,N-Diethyl-m-toluamide
DoD	Department of Defense
EA	Environmental Assessment
EIS	Environmental Impact Statement
EEE	Eastern Equine Encephalitis
EO	Executive Order
EPA	Environmental Protection Agency
°F	degrees Fahrenheit

F.A.C.	Florida Administrative Code
FCMP	Florida Coastal Management Program
FDEP	Florida Department of Environmental Protection
FESOP	Federally Enforceable State Operating Permit
FFWCC	Florida Fish & Wildlife Conservation Commission
FHD	Florida Health Department
FNAI	Florida Natural Areas Inventory
FONSI	Finding of No Significant Impact
FWS	Fish and Wildlife Service
g/l	Gallon Per Liter
HAZMAT	Hazardous Material
HAZMO	Hazardous Materials Management Office
ICUZ	Installation Compatible Use Zone
INRMP	Integrated Natural Resources Management
IPM	Integrated Pest Management
IREC	Interim Reregistration Eligibility Decision
ITU	International Toxic Units
lb/gal	Pounds Per Gallon
Ldn	Day/Night Average Sound Level
MASS	Modified Aerial Spray System
MSDS	Material Safety Data Sheet
MSL	Mean Sea Level
mph	Miles Per Hour
NEPA	National Environmental Policy Act
NHPA	National Register of Historic Places
NIOSH	National Institute of Occupational Safety and Health
NMFS	National Marine Fisheries Service
NO ₂	nitrogen dioxide
NSN	National Stock Number
NWI	National Wetlands Inventory
O ₃	ozone
PAO	Public Affairs Office
Pb	lead
PM ₁₀	particulate matter less than or equal to 10 microns in aerodynamic diameter
RCRA	Resource Conservation and Recovery Act
RED	Registration Eligibility Decision
SABM	St. Andrews beach mouse
SHPO	State Historic Preservation Officer
SLE	St. Louis Encephalitis
<i>spp.</i>	Species
SO ₂	sulfur dioxide
SR	Special Review
TM	Trade Mark
ULV	Ultra Low Volume

US	United States
USAF	United States Air Force
USAFR	United States Air Force Reserve
USEPA	United State Environmental Protection Agency
WEE	Western Equine Encephalitis
WMA	Wildlife Management Area
WNV	West Nile Virus

APPENDIX A

**FEDERAL AGENCY COASTAL ZONE MANAGEMENT ACT (CZMA)
NEGATIVE DETERMINATION**

APPENDIX A

FEDERAL AGENCY COASTAL ZONE MANAGEMENT ACT (CZMA) NEGATIVE DETERMINATION

Introduction

This document provides the State of Florida with the U.S. Air Force's Negative Determination under Section 307 of the Coastal Zone Management Act, 16 U.S.C. § 1456, and 15 C.F.R. Part 930.35. The information in this Negative Determination is provided pursuant to 15 C.F.R. Section 930.35.

This negative determination addresses the Proposed Action for conducting aerial mosquito control by applying a biochemical pest control agent, *Bacillus thuringiensis* var. *israeliensis* (*B.t.i.*; or biologically equivalent material), to control larval mosquitoes, and to apply the chemical pesticide, naled, to control adult mosquitoes, over approximately 17,000 acres of Tyndall Air Force Base (AFB) and approximately 145,000 acres of surrounding jurisdictions of Bay County and Gulf County.

Proposed Federal agency action:

The United States Air Force (USAF) proposes to conduct aerial spraying of pesticide to control adult mosquitoes and dog flies at Tyndall AFB, Florida and adjacent areas of Bay County and Gulf County. When maximum ground control is inadequate to control excessive mosquito population, aerial spraying is required to reduce the threat of a mosquito-borne disease outbreak. The transitory and unpredictable natures of dog fly infestations, which occur along the shorelines, often require rapid treatment to achieve control. Excessive populations of mosquitoes and dog flies restrict outdoor work and recreation, and thus, adversely affect the efficiency and morale of personnel.

Mosquito populations can be reduced by the application of microbial and chemical insecticides. The aerial dispersal of these materials, when done with care, has proven to be an effective means to reduce mosquito populations of certain species, over a broad area.

Federal Review

After review of the Florida Coastal Management Program and its enforceable policies, the U.S. Air Force has made a determination that this activity is one that will not have an effect on the state of Florida coastal zone or its resources.

Florida Coastal Management Program Consistency Review

Statute	Consistency	Scope
Chapter 161 <i>Beach and Shore Preservation</i>	The proposed project would not adversely affect beach and shore management, specifically as it pertains to: <ul style="list-style-type: none"> • The Coastal Construction Permit Program. • The Coastal Construction Control Line (CCCL) Permit Program. • The Coastal Zone Protection Program. 	Authorizes the Bureau of Beaches and Coastal Systems within DEP to regulate construction on or seaward of the states' beaches.
Chapter 163, Part II <i>Growth Policy; County and Municipal Planning; Land Development Regulation</i>	The proposed action would not affect local government comprehensive plans.	Requires local governments to prepare, adopt, and implement comprehensive plans that encourage the most appropriate use of land and natural resources in a manner consistent with the public interest.
Chapter 186 <i>State and Regional Planning</i>	The proposed action would not have a negative affect on state plans for water use, land development or transportation.	Details state-level planning requirements. Requires the development of special statewide plans governing water use, land development, and transportation.
Chapter 252 <i>Emergency Management</i>	The proposed action would not increase the state's vulnerability to natural disasters. Emergency response and evacuation procedures would not be impacted by the proposed action.	Provides for planning and implementation of the state's response to, efforts to recover from, and the mitigation of natural and manmade disasters.
Chapter 253 <i>State Lands</i>	The proposed action would not have a negative affect to state or public lands.	Addresses the state's administration of public lands and property of this state and provides direction regarding the acquisition, disposal, and management of all state lands.
Chapter 258 <i>State Parks and Preserves</i>	State parks, recreational areas and aquatic preserves would not be affected by the proposed action.	Addresses administration and management of state parks and preserves (Chapter 258).
Chapter 259 <i>Land Acquisition for Conservation or Recreation</i>	Tourism and outdoor recreation would not be affected.	Authorizes acquisition of environmentally endangered lands and outdoor recreation lands (Chapter 259).
Chapter 260 <i>Recreational Trails System</i>	Opportunities for recreation on state lands would not be affected.	Authorizes acquisition of land to create a recreational trails system and to facilitate management of the system (Chapter 260).
Chapter 375 <i>Multipurpose Outdoor Recreation; Land Acquisition, Management, and Conservation</i>	Opportunities for recreation on state lands would not be affected.	Develops comprehensive multipurpose outdoor recreation plan to document recreational supply and demand, describe current recreational opportunities, estimate need for additional recreational opportunities, and propose means to meet

		the identified needs (Chapter 375).
Chapter 267 <i>Historical Resources</i>	The proposed action would not have an impact on historic and/or cultural resources.	Addresses management and preservation of the state's archaeological and historical resources.
Chapter 288 <i>Commercial Development and Capital Improvements</i>	The proposed action would not have an effect on future business opportunities on state lands, or the promotion of tourism in the region.	Provides the framework for promoting and developing the general business, trade, and tourism components of the state economy.
Chapter 334 <i>Transportation Administration</i>	The proposed project would not have an impact on transportation.	Addresses the state's policy concerning transportation administration (Chapter 334).
Chapter 339 <i>Transportation Finance and Planning</i>	The proposed project would have no effect on the finance and planning needs of the state's transportation system.	Addresses the finance and planning needs of the state's transportation system (Chapter 339).
Chapter 370 <i>Saltwater Fisheries</i>	The proposed action would not have an effect on saltwater fisheries.	Addresses management and protection of the state's saltwater fisheries.
Chapter 372 <i>Wildlife</i>	The proposed action would not have a negative impact on wildlife resources.	Addresses the management of the wildlife resources of the state.
Chapter 373 <i>Water Resources</i>	The proposed action would not have an impact on water resources.	Addresses the state's policy concerning water resources.
Chapter 376 <i>Pollutant Discharge Prevention and Removal</i>	The proposed action will not have an impact on the transfer, storage, or transportation of pollutants.	Regulates transfer, storage, and transportation of pollutants, and cleanup of pollutant discharges.
Chapter 377 <i>Energy Resources</i>	Energy resource production, including oil and gas, and the transportation of oil and gas, would not be affected by the proposed action.	Addresses regulation, planning, and development of oil and gas resources of the state.
Chapter 380 <i>Land and Water Management</i>	Under the proposed action, development of state lands with regional (i.e. more than one county) impacts would not occur. No changes to coastal infrastructure such as capacity increases of existing coastal infrastructure, or use of state funds for infrastructure planning, designing or construction would occur.	Establishes land and water management policies to guide and coordinate local decisions relating to growth and development.
Chapter 381 <i>Public Health, General Provisions</i>	The proposed action does not involve the construction of an on-site sewage or treatment system.	Establishes public policy concerning the state's public health system.
Chapter 388 <i>Mosquito Control</i>	The proposed action would not affect mosquito control efforts.	Addresses mosquito control effort in the state.
Chapter 403 <i>Environmental Control</i>	The proposed action would have no impact on water quality, air quality, pollution control, solid waste management, or other environmental control efforts.	Establishes public policy concerning environmental control in the state.

APPENDIX B
REGULATORY AGENCY CORRESPONDENCE



Florida Department of Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Charlie CSM

June 10, 2008

Mr. Jose J. Cintron
Department of the Air Force
325 CES/CEV
119 Alabama Avenue
Tyndall AFB, FL 32403-5014

RE: Department of the Air Force - Draft Environmental Assessment, Aerial
Application of Pesticide for Mosquito Control at Tyndall Air Force Base
and Vicinity - Bay County, Florida.
SAI # FL200806104274C

Dear Mr. Cintron:

Florida State Clearinghouse staff, pursuant to Presidential Executive Order 12372,
Gubernatorial Executive Order 95-359, the Coastal Zone Management Act, 16 U.S.C. §§
1451-1464, as amended, and the National Environmental Policy Act, 42 U.S.C. §§ 4321,
4331-4335, 4341-4347, as amended, has reviewed the referenced Draft Environmental
Assessment (DEA).

Based on the information contained in the DEA and minimal project impacts, the state has
determined that the proposed federal activities are consistent with the Florida Coastal
Management Program.

Thank you for the opportunity to review the proposed project. Should you have any
questions regarding this letter, please contact Ms. Lauren P. Milligan at (850) 245-2170.

Yours sincerely,

Sally B. Mann, Director
Office of Intergovernmental Programs

SBM/lm



IN REPLY REFER TO:

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Field Office

1601 Balboa Avenue

Panama City, FL 32405-3721

Tel: (850) 769-0552

Fax: (850) 763-2177

June 30, 2008

Jose J. Cintron
325th CES/CEV
119 Alabama Avenue
Tyndall AFB, FL 32403-5014

Re: FWS No. 2008-I-0269
Draft Environmental Assessment
Aerial Application of Pesticides
Bay and Gulf Counties, Florida

Dear Mr. Cintron:

Thank you for your letter requesting review of the draft Environmental Assessment (EA) and draft Finding of No Significant Impact (FONSI). Our comments are provided in accordance with provisions of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 et seq.) and the National Environmental Policy Act (NEPA). We cannot concur with the FONSI or complete consultation under ESA until additional information is provided as described below.

Project Description

The United States Air Force (USAF) proposes to conduct aerial spraying of pesticides to control adult mosquitoes, biting midges and dog flies at Tyndall Air Force Base and in surrounding areas of Bay and Gulf counties. According to the description of the proposed action in the EA, the treatment area could include any community in Bay or Gulf County that is "associated with Tyndall AFB." Larval mosquito control would also be conducted on approximately 10,000 acres that have not yet been identified. The timing and duration of all treatments will be determined on an "as needed" basis with input from Bay County Mosquito Control Council, Gulf County Mosquito Control Council, and several military officials. The treatments would not exceed three events per season except under medical emergency conditions.

The ideal flight profile for treatment of adult mosquitoes is two hours before sunset if weather permits; however, some applications may be conducted after dark. Aircraft overflights would be at an elevation of 100 to 300 feet. The detailed description of the preferred alternative states that in a "typical season" one adulticide treatment for mosquitoes would occur in late May to early

June, another in June-July, and another treatment in August. The ideal larvicide treatment window is mentioned as being May-June. It is not clear whether treatment for dog flies and biting midges would be coincidental with mosquito treatment since control of these pests is not carried forward in the analysis of the alternatives.

Four alternative actions were considered and two others were eliminated from further study because they did not meet the project objectives and/or they were not feasible. The proposed action is identified as Alternative D:

Conduct aerial larval control using *B.t.i.*, Altosid, or biologically similar agent, and aerial adult mosquito control using Naled, on Tyndall AFB property and the adjacent cities of Bay and Gulf counties. Applications of each material would not exceed three treatments per season, except under medical emergency conditions.

It should be noted that the abstract for the EA describes Alternative D as including "other EPA approved products."

Biological Resources

The project area may include only Tyndall AFB and a few adjacent municipalities; however, it could also be expanded to include all portions of Bay and Gulf counties. Table 3-1 of the EA lists species that have been documented on Tyndall AFB or within a 50-mile radius of the base. A 50-mile radius would expand the project area to include several counties in addition to Bay and Gulf, thus adding to the list of species for consideration in the analysis. We recommend that the project area be defined as accurately as possible.

To assist with your further evaluation of the project, we are enclosing updated tables of threatened, endangered, and other special status species and their habitats for Bay and Gulf counties, Florida. The tables can also be found at our website: <http://www.fws.gov/panamacity/resources/specieslist.html>. Please note that the tables include a few species that are not in Table 3-1. The tables are a combination of species occurrence and habitat information developed by the Florida Natural Areas Inventory (FNAI), and species status data compiled by the Florida Fish and Wildlife Conservation Commission (FWC). Regardless of the status of the species appearing in the table, we encourage their conservation during project planning. Implementing conservation measures early in project planning may help avoid a need to list them in the future.

In view of the potential broad geographic range of the project and various treatment methods, we recommend additional analysis of the potential effects of the preferred alternative on non-target species. Particular attention should be paid to the following: Panama City crayfish (*Procambarus econfinae*), piping plover (*Charadrius melodus*), snowy plover (*Charadrius alexandrinus tenuirostris*), red-cockaded woodpecker (*Picoides borealis*), beach mice, and migratory birds. Potential effects that should be analyzed include the following:

- Effects of the named chemicals and "other EPA approved products" on the crayfish.
- Effects of the named chemicals and "other EPA approved products" on shorebird food resources specifically on intertidal flats, front beach, dunes, and within wrack areas.
- Effects of the named chemicals and "other EPA approved products" on food resources of other listed species and neotropical migrants.

Finally, the EA states, "All environmentally sensitive areas will be identified on the spray map and only sprayed if proper approval is obtained." We are available to assist with identification of these areas and development of a protocol for what constitutes "proper approval."

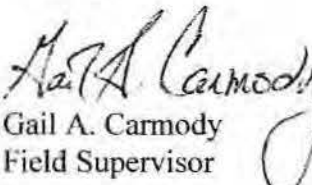
Consultation Requirements

Section 1.7 of the EA should include a sub-heading for the "Endangered Species Act." If a proposed action such as this potentially involves listed species or critical habitat, the federal agency must consult with the U.S. Fish and Wildlife Service (Service). Consultation can be informal or formal. It may be concluded informally if an action can be implemented in a way that is not likely to adversely affect listed species or critical habitat. Coordination with the Service to explore this possibility is encouraged.

If a determination is made that listed species or critical habitat may be adversely affected, the federal agency must request, in writing, formal consultation with the Service. If the proposed action is likely to jeopardize the continued existence of proposed species or result in the destruction or adverse modification of proposed critical habitat, the federal agency must confer with the Service.

Thank you for the opportunity to comment on this project. We hope you find this information helpful. Please contact Mr. Hildreth Cooper of this office at extension 221 for additional information and coordination.

Sincerely,


Gail A. Carmody
Field Supervisor

Enclosures:
Species Tables

STATE AND FEDERAL THREATENED, ENDANGERED, AND OTHER SPECIES OF CONCERN
 LIKELY TO OCCUR IN BAY COUNTY FLORIDA
 Compiled by U.S. Fish and Wildlife Service April 2007

Common Name	Scientific Name	Status State	Status FWS	Natural Communities
FISH:				
Gulf sturgeon	<i>Acipenser oxyrinchus desotoi</i>	SSC	T CH	ESTUARINE: various habitats MARINE: various habitats RIVERINE: alluvial and blackwater streams
Shoal bass	<i>Micropterus sp. (undescribed)</i>	SSC		RIVERINE: alluvial stream
Bluenose shiner	<i>Pteronotropis welaka</i>	SSC		RIVERINE: blackwater, alluvial, and spring-run streams
AMPHIBIANS & REPTILES:				
Flatwoods salamander	<i>Ambystoma cingulatum</i>	SSC	T pCH	PALUSTRINE: wet flatwoods, dome swamp, basin swamp, ruderal TERRESTRIAL: mesic flatwoods (reproduces in ephemeral wetlands within this community)
Loggerhead turtle	<i>Caretta caretta</i>	T	T	TERRESTRIAL: sandy beaches; nesting
Green turtle	<i>Chelonia mydas</i>	E	E	TERRESTRIAL: sandy beaches; nesting
Leatherback turtle	<i>Dermochelys coriacea</i>	E	E	TERRESTRIAL: sandy beaches; nesting
Eastern indigo snake	<i>Drymarchon corais couperi</i>	T	T	ESTUARINE: tidal swamp PALUSTRINE: hydric hammock, wet flatwoods TERRESTRIAL: mesic flatwoods, upland pine forest, sandhills, scrub, scrubby flatwoods, rockland hammock, ruderal
Hawksbill turtle	<i>Eretmochelys imbricata imbricata</i>	E	E	MARINE: open water; no nesting
Gopher tortoise	<i>Gopherus polyphemus</i>	SSC	ce	TERRESTRIAL: sandhills, scrub, scrubby flatwoods, xeric hammocks, coastal strand, ruderal
Kemp's Ridley turtle	<i>Lepidochelys kempii</i>	E	E	TERRESTRIAL: sandy beaches; nesting
Alligator snapping turtle	<i>Macrolemys temminckii</i>	SSC	ce	ESTUARINE: tidal marsh LACUSTRINE: river floodplain lake, swamp lake RIVERINE: alluvial stream, blackwater stream
Gulf salt marsh snake	<i>Nerodia clarkii clarkii</i>		ce	ESTUARINE: tidal marsh, tidal swamp MARINE: tidal marsh, tidal swamp
Florida pine snake	<i>Pituophis melanoleucus mugilus</i>	SSC	ce	LACUSTRINE: ruderal, sandhill upland lake TERRESTRIAL: sandhill, scrubby flatwoods, xeric hammock, ruderal
Gopher frog	<i>Rana capito</i>	SSC	ce	TERRESTRIAL: sandhill, scrub, scrubby flatwoods, xeric hammock (reproduces in ephemeral wetlands within these communities)
BIRDS:				
Bachman's sparrow	<i>Aimophila aestivalis</i>		ce	TERRESTRIAL: various, ruderal

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STATE AND FEDERAL THREATENED, ENDANGERED, AND OTHER SPECIES OF CONCERN
 LIKELY TO OCCUR IN BAY COUNTY FLORIDA
 Compiled by U.S. Fish and Wildlife Service April 2007

Common Name	Scientific Name	Status State	Status FWS	Natural Communities
Southeastern snowy plover	<i>Charadrius alexandrinus tenuirostris</i>	T	ce	ESTUARINE: exposed unconsolidated substrate MARINE: exposed unconsolidated substrate TERRESTRIAL: dunes, sandy beaches, and inlet areas
Piping plover	<i>Charadrius melodus</i>	T	T CH	ESTUARINE: exposed unconsolidated substrate MARINE: exposed unconsolidated substrate TERRESTRIAL: dunes, sandy beaches, and inlet areas. Mostly wintering and migrants.
Marian's marsh wren	<i>Cistothorus palustris marianae</i>	SSC		ESTUARINE: tidal marsh MARINE: tidal marsh
Stoddard's yellow-throated warbler	<i>Dendroica dominica stoddardi</i>		ce	TERRESTRIAL: wooded habitats with spanish moss, various
Little blue heron	<i>Egretta caerulea</i>	SSC		ESTUARINE: marshes, shoreline PALUSTRINE: floodplains, swamps RIVERINE: shoreline
Snowy egret	<i>Egretta thula</i>	SSC		ESTUARINE: marshes, tidal swamps, shoreline LACUSTRINE: lake edges PALUSTRINE: swamp, floodplain, ruderal RIVERINE: shoreline
Tricolored heron	<i>Egretta tricolor</i>	SSC		ESTUARINE: marshes, tidal swamps, shoreline LACUSTRINE: lake edges PALUSTRINE: swamp, floodplain, ruderal RIVERINE: shoreline
Arctic peregrine falcon	<i>Falco peregrinus tundrius</i>	E	ce	ESTUARINE: winters along coasts LACUSTRINE: various PALUSTRINE: various TERRESTRIAL: various, ruderal
Southeastern kestrel	<i>Falco sparverius paulus</i>	T	ce	ESTUARINE: various habitats PALUSTRINE: various habitats TERRESTRIAL: open pine forests, clearings, ruderal, various
Bald eagle	<i>Haliaeetus leucocephalus</i>	T	T	ESTUARINE: marsh edges, tidal swamp, open water LACUSTRINE: swamp lakes, edges PALUSTRINE: swamp, floodplain RIVERINE: shoreline, open water TERRESTRIAL: pine and hardwood forests, clearings
Wood stork	<i>Mycteria americana</i>	E	E	ESTUARINE: marshes LACUSTRINE: floodplain lakes, marshes (feeding), various PALUSTRINE: marshes, swamps, various
Brown pelican	<i>Pelecanus occidentalis</i>	SSC		ESTUARINE: islands for nesting, open water MARINE: open water
Red-cockaded woodpecker	<i>Picoides borealis</i>	SSC	E	TERRESTRIAL: mature pine forests

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Common Name	Scientific Name	Status State	Status FWS	Natural Communities
Black Skimmer	<i>Rynchops niger</i>	SSC		ESTUARINE: various LACUSTRINE: various RIVERINE: various TERRESTRIAL: ocean beaches, beach dune, ruderal. Nests common on rooftops.
Least tern	<i>Sterna antillarum</i>	T		ESTUARINE: various LACUSTRINE: various RIVERINE: various TERRESTRIAL: beach dune, ruderal. Nests common on rooftops.
MAMMALS:				
Choctawhatchee beach mouse	<i>Peromyscus polionotus alophrys</i>	E	E CH	TERRESTRIAL: beach dune, coastal scrub. Bay Co.: St. Andrew State Rec. Area mainland (CH) and Shell Island (CH), Tyndall Air Force Base Shell Island (CH). Walton Co.: Grayton Beach State Rec. Area (main CH & western units), Topsail Hill State Preserve (CH), Deer Lake State Park, Camp Creek, Four-Mile Village, Town of Grayton Beach and Seagrove Beach, Seaside. Okaloosa Co. historic range.
St. Andrew beach mouse	<i>Peromyscus polionotus peninsularis</i>	E	E CH	TERRESTRIAL: beach dune, coastal scrub. Bay Co. sites: Tyndall AFB (Crooked Island & mainland east to Mexico Beach canal), Gulf Co. sites: St. Joe Beach, St. Joseph Peninsula State Park, St. Joseph Peninsula, Cape San Blas (includes Eglin AFB), Cape San Blas east to Money Bayou.
West Indian manatee	<i>Trichechus manatus latirostris</i>	E	E	ESTUARINE: submerged vegetation, open water MARINE: open water, submerged vegetation RIVERINE: alluvial stream, blackwater stream, spring-run stream
Florida black bear	<i>Ursus americanus floridanus</i>	T	ce	PALUSTRINE: titi swamps, floodplains TERRESTRIAL: pine and hardwood forests
INVERTEBRATES:				
Gulf moccasinshell (mussel)	<i>Medionidus penicillatus</i>		E pCH	RIVERINE: medium-sized creeks to large rivers with sand and gravel substrates in slow to moderate currents (Panhandle watersheds: Chipola, Econfina Creek)
Oval pigtoe (mussel)	<i>Pleurobema pyriforme</i>		E pCH	RIVERINE: medium-sized creeks to small rivers; various substrates; slow to moderate currents (Panhandle watersheds: Chipola, Econfina Creek, Ochlockonee)

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Common Name	Scientific Name	Status State	Status FWS	Natural Communities
Panama City crayfish (Econfina crayfish)	<i>Procambarus econfinae</i>	SSC	ce	Palustrine: wet flatwoods; temporary or fluctuating ponds or semipermanently inundated ditches, also ruderal, roadside ditches and utility easements. Associated soil types: Pamlico-Dorovan Complex, Rutledge sand, Osier fine sand, Plummer sand, Pelham sand; some Leon sands.
Downy rainbow (mussel)	<i>Villosa villosa</i>		ce	RIVERINE: small streams to large rivers in sand or muddy sand substrates (Panhandle watersheds: Apalachicola, Chipola, Escambia, Choctawhatchee, Ochlockonee, Suwannee)
PLANTS:				
White Indian Plantain	<i>Amoglossum album</i>		ce	PALUSTRINE: wet flatwoods
Southern milkweed	<i>Asclepias viridula</i>	T	ce	PALUSTRINE: wet prairie, seepage slope edges RIVERINE: seepage stream banks TERRESTRIAL: mesic flatwoods, drainage ditches
Pine-woods aster	<i>Aster spinulosus</i>	E	ce	PALUSTRINE: seepage slope TERRESTRIAL: sandhill, scrubby and mesic flatwoods
Apalachicola wild indigo	<i>Baptisia megacarpa</i>	E		PALUSTRINE: floodplain forest TERRESTRIAL: upland mixed forest, slope forest
Curtiss' sandgrass	<i>Calamovilfa curtissii</i>	T	ce	PALUSTRINE: mesic and wet flatwoods, wet prairie, depression marsh TERRESTRIAL: mesic flatwoods
Sweet shrub	<i>Calycanthus floridus</i>	E		TERRESTRIAL: upland hardwood forest, slope forest, bluffs PALUSTRINE: bottomland forest, stream banks, floodplains
Baltzell's sedge	<i>Carex baltzellii</i>	T	ce	TERRESTRIAL: slope forest, moist sandy loam; moist sandy loam
Cruise's golden-aster	<i>Chrysopsis gossypina cruiseana</i>	E	ce	TERRESTRIAL: coastal dunes, coastal strand, coastal grassland; openings and blowouts
Rosebud orchid or spreading pagonia	<i>Cleistes divaricata</i>	T		PALUSTRINE: wet flatwoods
Alternate-leaf or pagoda dogwood	<i>Cornus alternifolia</i>	E		PALUSTRINE: creek swamps TERRESTRIAL: slope forest, upland hardwood forest, bluffs
Dew-thread	<i>Drosera filifolia</i>	E		LACUSTRINE: exposed lake bottoms
Spoon-leaved sundew	<i>Drosera intermedia</i>	T		LACUSTRINE: sinkhole lake edges PALUSTRINE: seepage slope, wet flatwoods, depression marsh RIVERINE: seepage stream banks, drainage ditches

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STATE AND FEDERAL THREATENED, ENDANGERED, AND OTHER SPECIES OF CONCERN
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Common Name	Scientific Name	Status State	Status FWS	Natural Communities
Dark-headed hatpin	<i>Eriocaulon nigrobacteatum</i>		ce	PALUSTRINE: Wet Boggy Seepage slopes, mucky soils
Telephus spurge	<i>Euphorbia telephioides</i>	E	T	TERRESTRIAL: mesic flatwoods; disturbed wiregrass (<i>Aristida stricta</i>) areas, coastal scrub. All <u>known</u> sites are within 4 miles of Gulf of Mexico.
Wiregrass gentian	<i>Gentiana pennelliana</i>	E	ce	PALUSTRINE: seepage slope, wet prairie, roadside ditches TERRESTRIAL: mesic flatwoods, planted slash pine
Harper's beauty	<i>Harperocallis flava</i>	E	E	PALUSTRINE: wet prairie, seepage slope, roadsides, edges of titi swamps
Panhandle spiderlily	<i>Hymenocallis henryae</i>	E	ce	PALUSTRINE: dome swamp edges, wet prairie, wet flatwoods, baygall edges, swamp edges TERRESTRIAL: wet prairies and flatwoods
Smooth-barked St. John's wort	<i>Hypericum lissophloeus</i>	E	ce	LACUSTRINE: sandhill upland lake margins TERRESTRIAL: sandhill upland lake margins
Florida anise	<i>Illicium floridanum</i>	T		PALUSTRINE: floodplain forest, baygall RIVERINE: seepage stream bank TERRESTRIAL: slope forest, seepage slope
Thick-leaved water willow	<i>Justicia crassifolia</i>	E	ce	PALUSTRINE: dome swamp, seepage slope TERRESTRIAL: mesic flatwoods
Mountain laurel	<i>Kalmia latifolia</i>	T		RIVERINE: seepage stream bank TERRESTRIAL: slope forest, seepage stream banks
Southern red lily	<i>Lilium catesbaei</i>	T		PALUSTRINE: wet prairie, wet flatwoods, seepage slope TERRESTRIAL: mesic flatwoods, seepage slope; usually with grasses
Gulf coast lupine	<i>Lupinus westianus</i>	T	ce	TERRESTRIAL: beach dune, scrub, disturbed areas, roadsides, blowouts in dunes
Curtiss' loosestrife	<i>Lythrum curtissii</i>	E	ce	PALUSTRINE: wet flatwoods edges, floodplain swamp, seepage slope, dome swamp edges TERRESTRIAL: seepage slope
White birds-in-a-nest	<i>Macbridea alba</i>	E	T	PALUSTRINE: seepage slope TERRESTRIAL: grassy mesic pine flatwoods, savannahs, roadsides, and similar habitat.
Hummingbird flower	<i>Macranthera flammea</i>	E		PALUSTRINE: seepage slope, dome swamp edges, floodplain swamps RIVERINE: seepage stream banks TERRESTRIAL: seepage slopes
Ashe's magnolia	<i>Magnolia ashei</i>	E		TERRESTRIAL: slope and upland hardwood forest, ravines

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Common Name	Scientific Name	Status State	Status FWS	Natural Communities
Pyramid magnolia	<i>Magnolia pyramidata</i>	E		TERRESTRIAL: slope forest
Giant water-dropwort	<i>Oxypolis filiformis greenmanii</i>	E		PALUSTRINE: dome swamp, wet flatwoods, ditches; in water
Crystal Lake nailwort	<i>Paronychia chartacea minima</i>	E	T	TERRESTRIAL: Karst sandhill lake margins
Hairy fever tree	<i>Pinckneya bracteata</i>	T		PALUSTRINE: creek swamps, titi swamps, bogs
Godfrey's (violet) butterwort	<i>Pinguicula ionantha</i>	E	T	PALUSTRINE: wet flatwoods, wet prairie, bog; in shallow water RIVERINE: seepage slope; in shallow water. Also, roadside ditches and similar habitat.
Yellow butterwort	<i>Pinguicula lutea</i>	T		PALUSTRINE: flatwoods, bogs
Chapman's butterwort	<i>Pinguicula planifolia</i>	T	ce	PALUSTRINE: wet flatwoods, seepage slopes, bog, dome swamp, ditches; in water
Primrose-flower butterwort	<i>Pinguicula primulifolia</i>	E		PALUSTRINE: bogs, pond margins, margins of spring runs
Bent golden aster	<i>Pityopsis flexuosa</i>	E	ce	TERRESTRIAL: sandhill, upland pine forest, ruderal
Yellow fringed orchid	<i>Platanthera ciliaris</i>	T		PALUSTRINE: bogs, wet flatwoods TERRESTRIAL: Bluff
Yellow fringeless orchid	<i>Platanthera integra</i>	E	ce	PALUSTRINE: wet prairie, seepage slope TERRESTRIAL: mesic flatwoods
Snowy orchid	<i>Platanthera nivea</i>	T		PALUSTRINE: bogs
Large-leaved jointweed	<i>Polygonella macrophylla</i>	T	ce	TERRESTRIAL: scrub, sand pine/oak scrub ridges
Meadowbeauty	<i>Rhexia parviflora</i>	E	ce	PALUSTRINE: dome swamp margin, seepage slope, depression marsh; on slopes; with hypericum
St. John's-susan	<i>Rudbeckia nitida</i>	E	ce	PALUSTRINE: wet flatwoods and prairies, roadside ditches
White-top pitcher plant	<i>Sarracenia leucophylla</i>	E	ce	PALUSTRINE: wet prairie, seepage slope, baygall edges, ditches
Parrot pitcher plant	<i>Sarracenia psittacina</i>	T		PALUSTRINE: wet flatwoods, wet prairie, seepage slope
Decumbant pitcher plant	<i>Sarracenia purpurea</i>	T		PALUSTRINE: Bogs
Florida skullcap	<i>Scutellaria floridana</i>	E	T	PALUSTRINE: seepage slope, wet flatwoods, grassy openings TERRESTRIAL: mesic flatwoods
Lace-lip	<i>Spiranthes laciniata</i>	T		PALUSTRINE: wet flatwoods
Silky camellia	<i>Stewartia malacodendron</i>	E		PALUSTRINE: baygall PALUSTRINE: slope forest, upland mixed forest, TERRESTRIAL: slope forest, upland mixed forest; acid soils

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Common Name	Scientific Name	Status State	Status FWS	Natural Communities
Chapman's crownbeard	<i>Verbesina chapmanii</i>	T	ce	PALUSTRINE: seepage slope TERRESTRIAL: mesic flatwoods with wiregrass (<i>Aristida stricta</i>)
Drummond's yellow-eyed grass	<i>Xyris drummondii</i>		ce	PALUSTRINE: wet flatwoods, bog, seepage slopes, ditches
Quillwort yellow-eyed grass	<i>Xyris isoetifolia</i>		ce	LACUSTRINE: sandhill upland lake margins PALUSTRINE: wet flatwoods, wet prairie
Karst pond xyris	<i>Xyris longisepala</i>	E		LACUSTRINE: sandhill upland lake margins
Harper's yellow-eyed grass	<i>Xyris scabrifolia</i>	T	ce	PALUSTRINE: seepage slope, wet prairie, bogs

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DEPARTMENT OF THE AIR FORCE
AIR EDUCATION AND TRAINING COMMAND

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RE: FWS No. 2008-I-0269- Draft Environmental Assessment Aerial Application of Pesticides

The following is submitted in response to your letter of June 30, 2008, requesting additional information regarding the Draft Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for Aerial Application of Pesticides for Mosquito Control at Tyndall AFB and vicinity.

Response to Comment No. 1: Larval mosquito control will not be part of the proposed action. Therefore the following changes will be made to the draft EA.

- a. Cover Sheet, Abstract, Alternative D has been revised as follow: "Conduct aerial adult mosquito control using Naled for such use on Tyndall AFB property and adjacent areas of the cities of Bay and Gulf Counties in order to create a buffer to mosquito activity. Applications would not exceed three treatments per season, except under medical emergency conditions."
- b. Section 2.1 has been revised as follow: "It is proposed to spray pesticides by aerial dispersal for adult mosquito control on approximately 17,000 acres of Tyndall AFB and approximately 145,000 acres of surrounding jurisdictions. The proposed treatment area would be limited to the base property and cities of Bay and Gulf Counties (Figures 2. 1, 2.2, and 2.3).
- c. Section 2.2, first sentence has been revised as follow: "The primary species to be controlled by this action are adult mosquitoes, adult dog flies, and adult biting midges."
- d. Section 2.3.1.4, Larval Surveillance, has been deleted.
- e. Section 2.4, third sentence has been revised as follow: "The spray operations would concentrate on periods of high mosquito activity for adult control measures."
- f. Section 2.5 has been revised as follow: "TrumpetTM1 (NSN 6840-01-532-5414,

Environmental Protection Agency (EPA) Reg. No. 59639-90-5481), a formulation of 78% Naled (1,2-dibromo-2,2-dichloroethyl dimethyl phosphate) with 22% inert ingredients is recommended in aerial application for adult mosquito control. The recommended aerial ultra-low-volume (ULV) application rate is 0.6 to 1.2 fluid ounce of undiluted TrumpetTM per acre. Trumpet EC is a special formulation intended for use only in its undiluted form and can be flushed with water.

See Appendices A for product labels and Material Safety Data Sheets.

TM Trumpet is a registered trademark of AMVAC Chemical Corporation, Los Angeles, CA"

g. Table 2-1 has been revised as follow:

Table 2-1
DECISION MATRIX FOR AERIAL MOSQUITO CONTROL
TYNDALL AFB AREAS,¹

Survey Methods and

Treatment Goals: Minimum Threshold Levels Required for Action

For Aerial Adult Control <u>Peak Rates Within 6 Days of Proposed Treatment</u>		
Adult Landing Rates ²	<u>In Marshlands</u>	<u>On main Installation</u>
<u>Immediate goal:</u>		
Disease Vector Control ³	5/minute	1/minute
Nuisance Control ⁴	25/minute	5/minute
<u>Long-term goal:</u>		
Egg Base Reduction (Subsequent generations)	5/minute	1/minute

For Aerial Adult Control <u>Peak Rates Within 5 Days of Proposed Treatment</u>		
Light Trap Counts ⁵		
New Standard Light Traps	Range/Marsh Site <u>Trap Index</u> *	Main Installation Sites <u>Trap Index</u>
<u>Immediate goal:</u>		
Disease Vector Control	20 females	15 females
Nuisance Control	75 females	35 females
<u>Long-term goal:</u>		
Egg Base Reduction (Subsequent generations)	25 females	5 females

*Number of collected females/(# traps x # nights)

DECISION MATRIX FOR AERIAL MOSQUITO CONTROL TYNDALL AFB AND VICINITY

Complaints These are obtained from key base personnel. They include: Airfield Control, Security Forces, Family Housing Representatives, Commanders, Senior Leaders, Golf Course Employees, Personnel using sports fields, and Public Health Personnel. Key personnel shall be solicited to comment on mosquito activity 1 to 3 days prior to aerial spray. Criteria shall be that these personnel consider mosquito populations to be moderate to heavy which, in turn, adversely affects their ability to conduct outdoor activities

Footnotes and Comment:

¹ This matrix applies to Tyndall AFB surveillance and pest management activities.

² On the proposed day of adult spraying, adult emergence should have peaked. Counts should be high or on the decrease as female mosquitoes leave the marshlands seeking blood meals. Landing rates are not used to validate the need for larval control. When fresh-water breeding adult mosquito activity is greatest, only measurements on main installation are useful.

³ When mosquito populations are judged to be a disease vector problem, their numbers may be below nuisance levels.

⁴ On the day of treatment, marsh-dwelling mosquitoes may not yet be a humanly perceived problem if they have not yet migrated away from the marshes.

⁵ On the day of aerial spraying, peak numbers may not be reached because marsh mosquitoes have just emerged and have not yet migrated to light trap locations. Prior to spraying there should be some indication that mosquito populations are building. For fresh-water breeding mosquitoes, the light trap is the primary surveillance method used to initiate and terminate adult mosquito control efforts, both aerial and ground based. It should be noted that trap catches are affected by environmental influences such as temperature, wind, rain, and moon phase.

Comment: All sampling methods provide a relative index of a biological population that is subject to wide swings in variation. All numbers listed above should be evaluated with a plus or minus 20 percent variation. Most importantly sampling data should indicate trends, specifically increasing populations and peak activity. The consensus of the representatives from Environmental, Public Health and Entomology offices would be the primary basis for classifying mosquitoes as a disease vector problem and using lower threshold limits.

h. Section 2.8.4, ALTERNATIVE D (Proposed Action) has been revised as follow: "Conduct aerial adult mosquito control using Naled, on Tyndall AFB property and the adjacent cities of Bay and Gulf Counties. Applications of this material would not exceed three treatments per season, except under medical emergency conditions."

i. Section 4.1.4, third paragraph has been revised as follow: "In summary, the aerial spraying of naled would only temporarily affect the local air quality. Droplets of naled settle to the ground, water, or vegetative substrate, within hours, where they rapidly begin to biodegrade and hydrolyze."

j. Section 4.2.4 has been revised as follow: "In the proposed concentration, naled would have no impact on the water quality of the area. Naled is nearly insoluble in water. Hydrolysis of the compound is initiated immediately upon contact with moisture, and the breakdown is proportional to the temperature and pH of the water. At 25 °C the half-life of naled in water is

15.4 hours at pH of 7 (Valent, 1995). Naled half-life in soil is ≤ 8 hours (EPA 1983) and is undetectable after one day under either aerobic or anaerobic conditions (Chen 1984). Under normal circumstances, most of the applied naled (and its major decomposition products) would be degraded within 24 hours of application (Chevron 1975, Valent 1995). The material is applied by ULV at a rate of 0.6 to 1.2 ounces per acre, thereby eliminating the possibility of runoff onto nontarget areas due to application procedures. Limited data indicate that the rapid dissipation and relatively low mobility of naled and intermediate mobility of DDVP (a degradate of naled) in soil would mitigate contamination of ground water (EPA 1983). Water quality, would not, therefore, be negatively affected.

k. Section 4.2.5 has been revised as follow: Precautions would be taken to avoid potential pesticide drift to surface bodies of water during application. All reservoir officials in the proposed area would be notified prior to a planned treatment so they can monitor specifically for naled, if circumstances warrant, to detect any potential pesticide residues which might be attributable to a misapplication or drift. The number of sprays would be limited to no more than three per season."

l. Section 4.3.4 has been revised as follow:
Naled

Smith (1987) summarized the persistence and hazard evaluation of Naled on wildlife and concluded that Naled has low environmental persistence, which may minimize prolonged exposure to wildlife. Additionally, no reported incidences of wildlife problems are attributable to Naled, even though Naled is commonly used in areas that provide wildlife habitat. Additional Laboratory test results of the effects of Naled on four species of freshwater organisms and three species of estuarine organisms determined that although its toxic effects ranged from moderately to very highly toxic, under true environmental conditions, this material can be used without adversely affecting non target aquatic organisms (Valent, 1995).

According to the US EPA's Naled Summary published in 1999, "Acute and chronic risk to freshwater and estuarine fish is not expected. There is potential for acute and some potential for chronic risks to freshwater invertebrates from all major uses of Naled." Naled used in mosquito control programs does not pose unreasonable risks to wildlife or the environment (Florida Department of Agriculture & Consumer Services, 2004). Naled degrades rapidly in the environment and it displays low toxicity to birds and mammals (USEPA 2002). Acute and chronic toxicity to fish is not expected based on the low application rate used for mosquito control. There is potential for adverse effects to aquatic invertebrates from repeated use of Naled; however, EPA has established specific precautions on the label to reduce such risk. Naled is considered toxic to bees. Droplets of the sprayed chemical are capable of contacting and killing foraging bees. However, there are no apiaries or commercial pollination activities in the spray area and applications will be made near sunset when bee activity is reduced or absent.

Aerial treatment with the proposed materials would not harm the known listed avian endangered or threatened species in the area. A reduction in adult mosquitoes/flying insect numbers due to treatment would have negligible impact on the base and surrounding communities -ranked bird

species in the proposed treatment area due to the type, diversity, and availability of organisms that they are known to feed upon. The nesting success of these avian species would not be impacted by disturbance because it is likely that birds in the vicinity are acclimated to aircraft presence due to the already-existing high volume of air traffic.

In summary, based upon currently available information, the proposed treatment using Naled should not significantly impact wildlife and non-target organisms due to these materials' target specificity, mode of action, low persistence, rapid biodegradability, and limited numbers of applications."

m. Section 4.6.4 has been revised as follow: "The most likely group of nontarget organisms that would be potentially affected by the proposed adulticide treatment would be other insects. Flying insects, especially those belonging to the Order Diptera (true flies; e.g., crane flies, black flies, midges, gnats, marsh flies, deer flies, muscoid flies) would likely be killed upon direct contact with the adulticide spray material. Bees and wasps (Hymenoptera), dragonflies and damselflies (Odonata), and moths and butterflies (Lepidoptera) would also be affected upon contact with the insecticide. Foraging bees and bees in unprotected beehives would be killed, necessitating careful coordination with beekeepers.

Naled is a human skin irritant, eye irritant, and may cause allergic skin reactions after prolonged and repeated contact. Serious toxicological health effects can occur in humans, if exposed to high enough concentrations and under prolonged duration. This would most likely occur as a result of occupational exposure due to mishandling of the material. It is therefore essential that all of the precautions set forth on the label (App E) and on the MSDS (App F) be strictly followed.

According to EPA officials, additional data, including human toxicology data, has been submitted to EPA by the manufacturer of naled, to fulfill reregistration requirements. These additional data have not triggered a Special Review (SR) process of naled by EPA. This suggests that no significant health risks are associated with this material, if used at the recommended label rate. The EPA is in the process of writing a Registration Eligibility Decision (RED).

In 1988 EPA initiated a SR of DDVP, a metabolite of naled in plants and animals, based on concerns regarding possible cancer and toxicologic effects. While EPA is requesting data from the manufacturer to determine the potential exposure to DDVP resulting from use of products containing naled, EPA has expressed minimal concern over continued use of naled (Valent 1995). Good management practices would still require that prudent effort should be made to notify residents within the treatment area prior to application so that those conducting outdoor activities during that time can minimize unnecessary inhalation and dermal exposure to the pesticide.

Naled would not harm pets or livestock animals at the recommended application rate. In fact, the label specifically allows treatment of livestock pastures, feedlots, and pastures including dairy cattle and indicates that it is not necessary to avoid farm buildings, dairy barns, and feed or forage areas. In animals and plants, Naled degrades rapidly to dichlorvos, which in turn degrades

rapidly to innocuous products (Chen, 1984).

Naled is corrosive and may harm certain automobile finishes if large droplets occur. The recommended droplet size for ULV aerial treatment of naled is 30-80 microns, with less than 5% of the droplets being 80 microns. Painted finishes should not be affected by droplets that size. This would be ensured by careful equipment calibration, stringent equipment maintenance, and quality control, all of which are USAir Force Reserve standard practices.

At the proposed rate of application, no evidence exists which suggests that naled would harm trees, plants or garden crops or that residues resulting from mosquito control would exceed established tolerances for raw agricultural commodities (EPA 1983, 1990). At the prescribed rate, no phytotoxic activity has been documented that would suggest harm to plants."

n. Section 4.7.4 has been revised as follow: "Naled pesticide containers would be triple rinsed with the designated spray carrier, rendered unusable, and disposed of in an approved landfill. Under no circumstances would the containers be used for any other purpose. The rinsate would be added to the mix tank. Any contaminated protective equipment would be handled as hazardous waste. The usage of pesticide will be authorized and tracked by the HAZMO office."

Response to Comment No. 2: Proposed Action would not include larvicide treatment. Treatment for dog flies and biting midges would be coincidental with mosquito treatment.

Response to Comment No. 3: Cover Sheet, Abstract, Alternative D has been revised as follow: "Conduct aerial adult mosquito control using Naled for such use on Tyndall AFB property and adjacent areas of the cities of Bay and Gulf Counties in order to create a buffer to mosquito activity. Applications would not exceed three treatments per season, except under medical emergency conditions."

Response to Comment No. 4: The proposed treatment area would be limited to base property, Bay County, and Gulf County. Only areas shown on Figures 2.1, 2.2, and 2.3 would be included in the proposed action.

Section 1.3, second paragraph has been revised as follow: "Bay and Gulf Counties Mosquito Control Council will determine where mosquito hot spots are located in the counties to ensure only problem areas are treated. Under most circumstances, only hot spots within this spray area will be treated unless a significant mosquito-borne disease threat is present. All environmentally sensitive areas will be identified on the spray map and only sprayed if proper approval is obtained. Apiaries and known sensitive individuals will be identified and public notifications will be carried out prior to any aerial spraying."

Section 2.1 has been revised as follow: "It is proposed to spray pesticides by aerial dispersal for adult mosquito control on approximately 17,000 acres of Tyndall AFB and approximately 145,000 acres of surrounding jurisdictions. The proposed treatment area would be limited to the base property and cities of Bay and Gulf Counties (Figures 2. 1, 2.2, and 2.3)."

Response to Comment No. 5: Table 3-1 has been replaced with updated tables (submitted by USFWS) of threatened, endangered, and other special status species for Bay and Gulf Counties.

Response to Comment No. 6: The USFWS lists the following species as of particular concern within the proposed treatment area: Panama City crayfish (*Procambarus econfinae*), piping plover (*Charadrius melodus*), snowy plover (*Charadrius alexandrinus tenuirostris*), red-cockaded woodpecker (*Picoides borealis*), beach mice, and migratory birds. The pesticide naled has been chosen as the best-practice mosquito adulticide in order to minimize risks to these and other wildlife species. The low-level of pesticide applied in these operations do not pose a risk to birds; in fact, vector control operations may benefit birds by reducing West Nile virus transmission within and among populations. Recent studies have demonstrated that adult mosquito control efforts have few if any nontarget insect effects (Boyce et al. 2007, Davis & Peterson 2008, Breidenbaugh & de Szalay, in review) This implies that insectivorous birds foraging in habitats such as intertidal flats, front beach, dunes, and with wrack areas should not be affected from reduced food resources. Furthermore, label rates for naled (maximum 0.1 lb/acre) do not create runoff and do not reach levels of concern for crayfish (96-h LC50 = ppb 1800) or mice. For example, Wang et al. (1987) found naled concentration in water to be 20 ppb 30 minutes after application which was reduced to 0.2 ppb at 6 hours post-spray because naled breaks down rapidly.

Boyce WM, Lawler SP, Schultz JM, McCauley SJ, Kimsey LS, Niemela MK, Nielsen CF, Reisen WK. 2007. Nontarget effects of the mosquito adulticide pyrethrin applied aerially during a West Nile virus outbreak in an urban California environment. *J Am Mosq Control Assoc* 23:335–339.

Davis RS, Peterson RKD. 2008. Effects of single and multiple applications of mosquito insecticides on nontarget arthropods. *J Am Mosq Control Assoc* 24:270–280.

Wang TC, Lenahan RA, Tucker JW, Kadlac T. 1987. Aerial spray of mosquito adulticides in a salt marsh environment. *Wat Sci Tech* 19:113-124.

The following paragraph was added to section 4.3.5:

“Personnel from the U.S. Fish and Wildlife Service (USF&WS) have expressed concerns regarding the potential impact of aerial spray operations on the following federally listed species: the Panama City crayfish (*Procambarus econfinae*); the Snowy Plover (*Charadrius alexandrinus tenuirostris*); the Piping Plover (*Charadrius melodus*) re-cockaded woodpecker (*Picoides borealis*); beach mice and migratory birds. All the species indicated would not be impacted due to the designated exclusion of these sites from treatment.”

Response to Comment No. 7: Noted

Response to Comment No. 8: The following sub-section was added to Section 1.7:

“1.7.2.1 Endangered Species Act”

"Endangered Species Act requires that all federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitat. If a proposed action involves listed species or critical habitat, the federal agency must consult with the USFWS."

If you have any questions concerning the reference project please contact Mr. Jose J. Cintron, phone number (850) 283-4341, email jose.cintron@tyndall.af.mil.

Sincerely

A handwritten signature in cursive script that reads "Joseph V. McLernan".

JOSEPH V. MCLERNAN
Chief, Environmental Flight

APPENDIX C
PUBLIC INVOLVEMENT

Florida Freedom Newspapers, Inc.

PUBLISHERS OF THE NEWS HERALD
Panama City, Bay County, Florida
Published Daily

State of Florida County of Bay

Before the undersigned authority appeared Glenda Sullivan, who on oath says that she is Classified In-Column Manager of The News Herald, a daily newspaper published at Panama City, in Bay County, Florida; that the attached copy of advertisement, being a Legal Advertisement - # 7602 in the matter of Public Notice - Review of Environmental Assessment in the Bay County Court, was published in said newspaper in the issue of June 15, 2008

Affiant further says that The News Herald is a direct successor of the Panama City News and that this publication, together with its direct predecessor, has been continuously published in said Bay County, Florida, each day (except that the predecessor, Panama City News, was not published on Sundays), and that this publication together with its said predecessor, has been entered as periodicals matter at the post office in Panama City, in said Bay County, Florida, for a period of 1 year next preceding the first publication of the attached copy of advertisement; and affiant further says that she or she has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

Glenda Sullivan

State of Florida

County of Bay

Sworn and subscribed before me this 16th day of June, A.D., 2008, by Glenda Sullivan, Classified In-Column Manager of The News Herald, who is personally known to me or has produced N/A as identification.



Marie L. Forrest
Notary Public, State of Florida at Large

7602 PUBLIC NOTICE

REVIEW OF ENVIRONMENTAL ASSESSMENT For Aerial Application of Pesticide for Mosquito Control at Tyndall Air Force Base and Vicinity

The 325th Fighter Wing, Tyndall Air Force Base (AFB), has prepared a Draft Finding of No Significant Impact (FONSI) and supporting Draft Environmental Assessment (EA) for Aerial Application of Pesticide for Mosquito Control at Tyndall Air Force Base and Vicinity. The objectives of this action is to reduce the potential threat of human disease caused by mosquito vectors through intervention in the transmission cycle and to reduce mosquito-induced discomfort, hardship, annoyance, and distraction experienced by personnel at Tyndall AFB and surrounding civilian communities. The Draft FONSI and EA have been prepared in accordance with the National Environmental Policy Act of 1968. The Draft FONSI and EA are available for public review and comment beginning 15 June 2008 at the Bay County Public Library, located at 25 West Government Street, Panama City, Florida 32401, and at the 325th Fighter Wing Public Affairs Office, located at the address below. The comment period will close on 14 July 2008. Address written comments to the 325th Fighter Wing Public Affairs, 445 Suwanee Road, Suite 129, Tyndall AFB, Florida 32403; telephone: (850) 283-4500.

PRIVACY ADVISORY: Comments on this Draft EA are requested pursuant to the National Environmental Policy Act, 42 United States Code 4321, et seq. Providing private address information with your comment is voluntary and such personal information will be kept confidential unless release is required by law. Letters or other public comment documents provided may be published in the Final EA and made available to the public. However, only the name of the individual and specific comments will be disclosed.
June 15, 2008

APPENDIX D
MATERIAL SAFETY DATA SHEET

DIBROM[®] CONCENTRATE

INSECTICIDE

ACTIVE INGREDIENT:

*Naled87.4%

OTHER INGREDIENTS:12.6%

TOTAL 100.0%

*1,2-dibromo-2, 2-dichloroethyl dimethyl phosphate

KEEP OUT OF REACH OF CHILDREN

DANGER

DO NOT TAKE INTERNALLY. DO NOT GET IN EYES. DO NOT GET ON SKIN.
SEE BELOW FOR ADDITIONAL PRECAUTIONARY STATEMENTS

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER

CORROSIVE: Causes irreversible eye and skin damage. May be fatal if swallowed, inhaled or absorbed through the skin. May cause allergic skin reaction. Do not get in eyes, on skin, or on clothing. Do not breathe vapor or spray mist.

When handling this material wear: coveralls over long-sleeved shirt and long pants; chemical-resistant gloves such as barrier laminate, butyl rubber ≥ 14 mils, nitrile rubber ≥ 14 mils and viton ≥ 14 mils; chemical-resistant footwear plus socks; protective eyewear; chemical-resistant headgear for overhead exposure; chemical-resistant apron when cleaning equipment, mixing, or loading; and respirator with either an organic-vapor-removing cartridge with a pre-filter approved for pesticides (MSHA/NIOSH approval number prefix TC-23C) or a canister approved for pesticides (MSHA/NIOSH approval number prefix TC-14G).

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240 (d) (4-6)], the handler's PPE may be reduced or modified as specified in the WPS. Wash thoroughly with soap and water after handling and before eating, drinking, or using tobacco. Remove contaminated clothing and wash before reuse.

STATEMENT OF PRACTICAL TREATMENT

If in eyes: Immediately hold eyelids open and flush with steady, gentle stream of water for 15 minutes. Get medical attention immediately.

If on skin: Wash with plenty of soap and water. Get medical attention immediately.

If swallowed: Drink a large quantity of milk, egg whites, gelatin solution, or if these are not available, drink large quantities of water. Avoid alcohol. Contact a physician, Poison Control Center, or emergency center. Do not induce vomiting. Take person and product container to the nearest medical emergency treatment center.

If inhaled: Remove victim to fresh air. If not breathing, give artificial respiration and get medical attention immediately.

Note to Physicians: Emergency information call 1-800-228-5635 ext.169. Naled is a cholinesterase inhibitor. Measurement of blood cholinesterase activity may be useful in monitoring exposure. If signs of cholinesterase inhibition appear, atropine sulfate is antidotal. 2-PAM (Protopam) is also antidotal and may be used in conjunction with atropine, but should not be used alone. Probable mucosal damage may contraindicate the use of gastric lavage.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to fish, aquatic invertebrates, and wildlife. Do not apply directly to water except when used over water as labeled for adult mosquito, blackfly, or housefly control. For terrestrial uses. Do not apply directly to water, or to intertidal areas where surface water is present, or to intertidal areas below the mean high watermark. Runoff from treated areas may be hazardous to aquatic organisms in neighboring areas. Do not contaminate water when disposing of equipment washwaters. This product is highly toxic to bees exposed to direct treatment on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds while bees are actively visiting the treatment area.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. In New York State, direct application to water is prohibited.

READ ENTIRE LABEL. USE STRICTLY IN ACCORDANCE WITH PRECAUTIONARY STATEMENTS AND DIRECTIONS, AND WITH APPLICABLE STATE AND FEDERAL REGULATIONS.

EPA REG. NO. 5481-480

EPA EST. NO. 5481-CA-1



4100 E. Washington Boulevard, Los Angeles, CA 90023

TANK MIXES

NOTICE: Tank mixing or use of this product with any other product, which is not specifically and expressly authorized by the label, shall be the exclusive risk of user, applicator, and/or application advisor.

Read and follow the entire label of each product to be used in the tank mix with this product.

DIBROM Concentrate is a special formulation for use undiluted or diluted in diesel oil to be applied for the control of mosquitoes, houseflies and certain other nuisance insects. **This product cannot be diluted with water.**

DIBROM CONCENTRATE IS FOR USE ONLY BY TRAINED PERSONNEL IN COMMERCIAL PEST CONTROL AND PUBLIC HEALTH ABATEMENT PROGRAMS.

OPERATIONAL USE INSTRUCTIONS

All equipment used in the mixing or application (by ground or air) of DIBROM Concentrate should be constructed of corrosion-resistant materials. Stainless steel, bronze, brass, fiberglass, polypropylene and rigid PVC have all proven fairly resistant to the effects of DIBROM Concentrate. Use of Teflon or Viton seals is recommended. Avoid use of steel or galvanized steel. Even when these materials are used to construct a spray system, a careful maintenance program involving flushing, cleaning and constant inspection must be followed.

Strain DIBROM Concentrate as it is being loaded. Use a 100-mesh stainless steel or nylon screen. If product crystallization occurs warm at 70°F until crystals disappear. The use of DIBROM Concentrate and some grades of diesel fuel may result in precipitates, which causes nozzle clogging and operational difficulties.

Flushing the system following application is essential. Use of Heavy Aromatic Naphtha (HAN), "Jet A" aircraft fuel, Aromatic 150, Aromatic 200, and Aromatic 200ND have been reported as successful. Isopropyl or methyl alcohol is not recommended for flushing due to their low flash point.

DIBROM Concentrate must be applied using the correct droplet size. Over-atomization produces finer particles which either evaporate or dissipate too quickly and become unavailable for mosquito contact. The spread factor for DIBROM Concentrate on silicon or Teflon-coated slides is 0.54 and 0.7, respectively. If applied incorrectly, DIBROM Concentrate will spot certain automobile paint finishes. Careful attention to recommendations concerning nozzles, nozzle positioning, air speed and droplet size is essential to avoid paint spotting.

A technical bulletin, *DIBROM Concentrate for Use in Mosquito Control Programs*, contains detailed information on equipment for ULV applications.

Aerial Application: Aerial application must be made with closed cockpit aircraft. Spray during periods when wind is 10 mph or less and when thermal activity is low. Nozzles must be positioned 45° to 90° (perpendicular to airflow) into the wind. This positioning results in the maximum wind shear across the face of the nozzles and creates the smallest particles. Air speed should be in excess of 100 mph to assure enough force to create maximum spray atomization. Aircraft flying at slower speeds should be equipped with atomizing nozzles. Use spray nozzles that will produce 30 to 80 micron size droplets. No more than 5% of the droplets should be larger than 80 microns.

Ground Application: Maximum effect is produced by particles 11 to 20 microns in size. Mass median diameter of the droplets produced should not exceed 15 microns and no droplet should be larger than 50 microns. Excessive pressure and over atomization result in poor mosquito control.

ADULT MOSQUITO CONTROL

Adult Mosquito Control in Residential Areas, Municipalities, Tidal Marshes, Swamps, Woodlands, Agricultural Areas (when applied in wide-area public pest control programs sponsored by governmental entities), Livestock Pastures, Feed Lots and Pastures including Dairy Cattle: It is not necessary to avoid farm buildings, dairy barns, feed or forage areas. Not for use on trees being grown for sale or other commercial use, or for commercial seed production, or for the production of timber, or wood products, or for research purposes (unless applied in wide-area public pest control programs sponsored by governmental entities). Use in agricultural areas should be in a manner as to ensure that residues do not exceed the established federal tolerance for the active ingredient in or on raw agricultural commodities resulting from use for area pest control. Treat shrubbery and vegetation where mosquitoes may rest. Shrubby and vegetation around stagnant pools, marshy areas, swamps, residential areas, municipalities, woodlands, pastures, farm buildings and feed lots may be treated.

Ultra Low Volume (ULV) Aerial Application: Apply ½ to 1 fl oz of undiluted product per acre. Use the 1 oz rate where heavy vegetation exists (i.e., woodlands, etc.).

Dilute Aerial Application: Dilute 50 to 100 oz (1.6 to 3.1 qts) DIBROM Concentrate in 100 gals No. 2 Fuel Oil or diesel oil. Apply at the rate of 1 gal diluted material per acre. This is equivalent to 0.05 to 0.10 lb actual DIBROM per acre or dilute 1.0 fl oz DIBROM Concentrate with HAN (Heavy Aromatic Naphtha) to make 16 fl oz. Apply at the rate of 16 fl oz of dilute mixture per acre. This is equivalent to 0.10 lb actual DIBROM per acre.

Ultra Low Volume (ULV) Ground Application: Apply DIBROM Concentrate undiluted at the rate of 0.6 fl. oz. per minute at 5 mph; 1.2 fl oz per minute at 10 mph; and 1.8 fl oz per minute at 15 mph, applying a 300 ft swath. These flow rates are equivalent to 0.02 lb actual DIBROM per acre.

CAUTION:

Special Instructions: This application can be made only under the following conditions:

1. Application can be made only by appropriately licensed and certified personnel with public agencies or private contractors operating in conjunction with or under contract with such government agencies.
2. Application in calm air conditions is to be avoided.
3. Application is not to be made in the immediate vicinity of pedestrians.
4. Vehicles used to apply DIBROM Concentrate must be air-conditioned or equipped with automatic speed control flow device.

Dilute Ground Application: Dilute 2 qts (64 fl oz) DIBROM Concentrate in soybean oil or HAN to make 5 gals of dilute solution. Apply at the rate of 3 to 6 fl oz per minute at a vehicle speed of 5 mph, applying a swath 300 ft wide; deliver 6 to 12 fl oz per minute at 10 mph; deliver 9 to 18 fl oz per minute at 15 mph. This is equivalent to .01 to 0.02 lb actual DIBROM per acre. Use the high rate and slower speed to penetrate dense vegetation.

Thermal Fog Application: Dilute 3.1 qts (100 fl oz) DIBROM Concentrate in 99 gals No. 2 Fuel Oil or diesel oil or 10 oz in 10 gals oil. Apply either at the rate of 40 gals per hour at 5 mph; 80 gals per hour at 10 mph; or 120 gals per hour at 15 mph, applying swath 300 to 400 feet wide.

BLACKFLIES, HOUSEFLIES, GNATS, CERTAIN OTHER NUISANCE INSECTS

Small Flying Moths, Crane Flies, Midges, Adult Stable Flies (Dog Flies) in Residential Areas, Municipalities, Woodlands, Livestock Pastures, Feed Lots and Pastures Including Dairy Cattle: It is not necessary to avoid farm buildings, dairy barns, and feed or forage areas. Not for use tree being grown for sale or other commercial use, or for commercial sod production or for the production of timber or wood products, or for research purposes (unless applied as wide-area public pest control programs sponsored governmental entities.)

Thermal Fog Ground Application: Dilute 1 gal DIBROM Concentrate in 99 gals of No. 2 Fuel Oil or diesel oil or 13 oz per 10 gals oil. Apply at a rate of 40 gals per hour output at an average vehicle speed of 5 mph, applying swath 300 to 400 feet wide.

Thermal Fog Aerial Application: Dilute 100 to 230 fl oz (¼ to 1 ¾ gals) DIBROM Concentrate in 100 gals No. 2 Fuel Oil. **Smaller insects – Gnats and Midges:** ¼ to 1 gal. **Houseflies, Flying Moths:** 1 to 1½ gals. Apply 1 gal diluted material per acre. This is equivalent to 0.1 to 0.2 lb actual DIBROM per acre. **Suppression of Blackflies:** Dilute 1.5 fl oz DIBROM Concentrate with 14.5 fl oz HAN. Apply at the rate of 16 fl oz of diluted mix per acre. This is equivalent to 0.16 lb actual DIBROM per acre.

HORN FLIES (Range Cattle)

Aerial Application: Apply 2 to 4 fl oz DIBROM Concentrate undiluted per acre. Use higher rate for heavier fly populations. This is equivalent to 0.2 to 0.4 lb actual DIBROM per acre.

SUPPRESSION OF DEER FLIES

Aerial Application: Apply 1 to 2 fl oz DIBROM Concentrate undiluted per acre. Use higher rate in denser vegetation. This is equivalent to 0.1 to 0.2 lb actual DIBROM per acre.

Do not apply under conditions involving possible drift to food, forage or other plantings that might be damaged or the crops thereof rendered unfit for sale, use, or consumption.

STORAGE AND DISPOSAL

PROHIBITIONS

Do not contaminate water, food, or feed by storage, disposal or cleaning of equipment. Open dumping is prohibited.

STORAGE

Keep pesticide in original container. Do not put concentrate or dilute into food or dilute into food or drink containers. For help with any spill, leak, fire, or exposure involving this material, call day or night 1-800-424-9300.

PESTICIDE DISPOSAL

This product is acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste Representative at the nearest EPA Regional Office for guidance.

CONTAINER DISPOSAL

Triple rinse (or equivalent). Do not reuse container. Offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration or, if allowed by State and local authorities, by burning. If burned, stay out of smoke. Dispose of in a sanitary landfill or by other procedures allowed by State and local authorities.

OR (for returnable containers)

CONTAINER REUSE

Returnable Container: This container is a dedicated, single product returnable container. Refill this container only with pesticide. Return empty container to seller or to location designated as a collection point. Do not break seals, add anything to container, or open container after use. Do not rinse or contaminate empty container or use it for any other purposes.

LIMITED WARRANTY AND DISCLAIMER

The manufacturer warrants (a) that this product conform to the chemical description on the label; (b) that this product is reasonably fit for the purposes set forth in the directions for use, subject to the inherent risks referred to herein, when it is used in accordance with such directions; and (c) that the directions, warnings, and other statements on this label are based upon responsible experts' evaluations of reasonable tests of effectiveness, of toxicity to laboratory animals and to plants and residues on food crops, and upon reports of field experience. Tests have not been made on all varieties of food crops and plants, or in all states or under all conditions.

THERE ARE NO EXPRESS WARRANTIES OTHER THAN THOSE SET FORTH HEREIN. THE MANUFACTURER NEITHER MAKES NOR INTENDS, NOR DOES IT AUTHORIZE ANY AGENT OR REPRESENTATIVE, TO MAKE ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, AND IT EXPRESSLY EXCLUDES AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY OF FITNESS FOR A PARTICULAR PURPOSE, OR ANY WARRANTY OF QUALITY OR PERFORMANCE. THIS WARRANTY DOES NOT EXTEND TO, AND THE BUYER SHALL BE SOLELY RESPONSIBLE FOR, ANY AND ALL LOSS OR DAMAGE WHICH RESULTS FROM THE USE OF THIS PRODUCT IN ANY MANNER WHICH IS INCONSISTENT WITH THE LABEL DIRECTIONS, WARNINGS OR CAUTIONS.

BUYER'S EXCLUSIVE REMEDY AND MANUFACTURER'S OR SELLER'S EXCLUSIVE LIABILITY FOR ANY AND ALL CLAIMS, LOSSES, DAMAGES, OR INJURIES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT, WHETHER OR NOT BASED IN CONTRACT, NEGLIGENCE, STRICT LIABILITY IN TORT OR OTHERWISE, SHALL BE LIMITED, AT THE MANUFACTURER'S OPTION, TO REPLACEMENT OF, OR THE REPAYMENT OF THE PURCHASE PRICE FOR, THE QUANTITY OF PRODUCT WITH RESPECT TO WHICH DAMAGES ARE CLAIMED. IN NO EVENT, SHALL MANUFACTURER OR SELLER BE LIABLE FOR SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT.

AMVAC offers this product, and Buyer accepts it, subject to the foregoing Limited Warranty, which may be varied only by agreement in writing signed by an authorized representative of AMVAC.

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